INDIA RUBBER WORLD

JANUARY 1, 1942

A BILL BROTHERS PUBLICATION

Newsletter No. 1 *PUBLISHED BY RUBBER CHEMICALS DIVISION OF* DU PONT *JANUARY 1942*

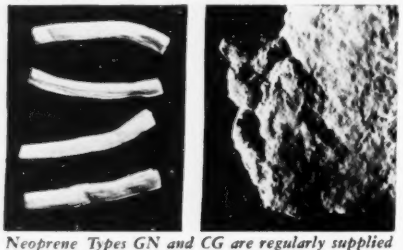
Neoprene Produced in Different Types for Special Service Conditions

NATURE gives us essentially one rubber which we must adapt through compounding to all applications; chemistry has not limited us similarly but has given us a variety of neoprenes, each of which has some particular property of outstanding merit. In studying the several commercial types of neoprene, we find all to be rubberlike, oil and chemical resistant, non-burning and to have long life in sunlight and at elevated temperatures. They are alike in their fundamental properties and in their superiority to natural rubber; they differ in minor ways and in the degree of the excellence of their special characteristics.

NEOPRENE TYPE GN, a general-purpose, odorless neoprene, is produced in the largest quantity and is the most widely used type. It is supplied in "roped" form, unplasticized. Neoprene Type GN can be plasticized by cold milling without a chemical plasticizer or with a small amount of plasticizer—Latac or Accelerator 552. When properly plasticized and compounded, it processes well in all operations and can be used for any product requiring high resistance to oils, heat, weather, flame, water and chemicals. The physical properties of Type GN vulcanizates are comparable to those of rubber.

NEOPRENE TYPE E, developed before Type GN, is second in volume. It is darker in color, has a slight, characteristic odor and is furnished in pre-plasticized slab form. Type E requires no preparation for mixing beyond a short breakdown on the mill, but it has a slower rate of cure than Type GN. Type E is a general-purpose neoprene which, as compared with Type GN, offers little if any advantages but some disadvantages.

NEOPRENE TYPE I is a special purpose neoprene developed to meet the need for greater oil resistance. It is a pre-plasticized type which breaks down and mixes readily and processes exceptionally well. It is too oil and solvent resistant to make good cements. Type I vulcanizates show a minimum of swell and deterioration after long immersion in oils and solvents. The water resistance of Type I vulcanizates is better than that of Type E or Type GN vulcanizates.



Neoprene Types GN and CG are regularly supplied in "roped" form (left); Types E, M, I, FR, G and GW are supplied as preplasticized rough slabs (right).

NEOPRENE TYPE FR is a special purpose neoprene having outstanding freeze resistance. Its vulcanizates harden more slowly at low temperatures and retain their rubbery characteristics at lower temperatures than any other neoprene. It was developed especially for products that must perform at subzero temperatures and is of special importance to the automotive and aircraft industries. Type FR is a pre-plasticized neoprene which breaks down and mills much like rubber. It does not tend to stick to mill rolls even when hot and therefore processes easily. In addition to being freeze resistant, it is as water resistant as Type I.

NEOPRENE TYPE CG is another unplasticized special purpose neoprene in "roped" form, developed especially for adhesive cements. It plasticizes readily on the mill without chemical plasticizer in spite of its original toughness and hardness. In the raw state it freezes at relatively high temperatures, but, after being properly compounded and cured, Type CG vulcanizates increase in hardness on aging at room temperature no more than Type GN vulcanizates. The uncured stiffness and toughness of Type CG cause thin films deposited from its cements to have greater initial strength than films from any other neoprene cement. After vulcanization, the permanent bond provided by CG cements is very strong. Type CG has a higher cured tensile strength than Type GN.

NEOPRENE TYPE M is one of the older, special neoprenes. It is identical with Type E except that it is stabilized with a chemical that does not discolor gasoline. It is used primarily for gasoline hose.

NEOPRENE LATEX Water dispersions of neoprene are available under this name. Vulcanized films from Neoprene Latex compositions exhibit the properties of products made from dry neoprene. Neoprene Latex Type 56 and Type 57 contain 50% solids by weight and are used for producing thin films and coatings, also for impregnations. Neoprene Latex Type 60 containing 60% solids is particularly recommended for foam sponge.

Through the Mill

WELCOME...*to "Through The Mill." Here we hope to bring you interesting and helpful bits of information, last minute news, and anything that we think you'd like to know about.*

WRITE FOR THESE TWO PUBLICATIONS:

The Neoprene Notebook carries up-to-date information on new uses for neoprene. Ask to get on the mailing list.

The Neoprene Handbook contains background & interesting data on neoprene and its uses.

THIONEX—*At the present price Thionex is one of the most economical accelerators to use for a wide variety of compounds. Shall we send you a working sample?*

NEOPRENE TYPE CG.—*This new type of neoprene, developed particularly for use in adhesives, is now produced in an orange color to differentiate it from Neoprene Type GN.*

DU PONT

Your rubber problems are never too big or too little for the

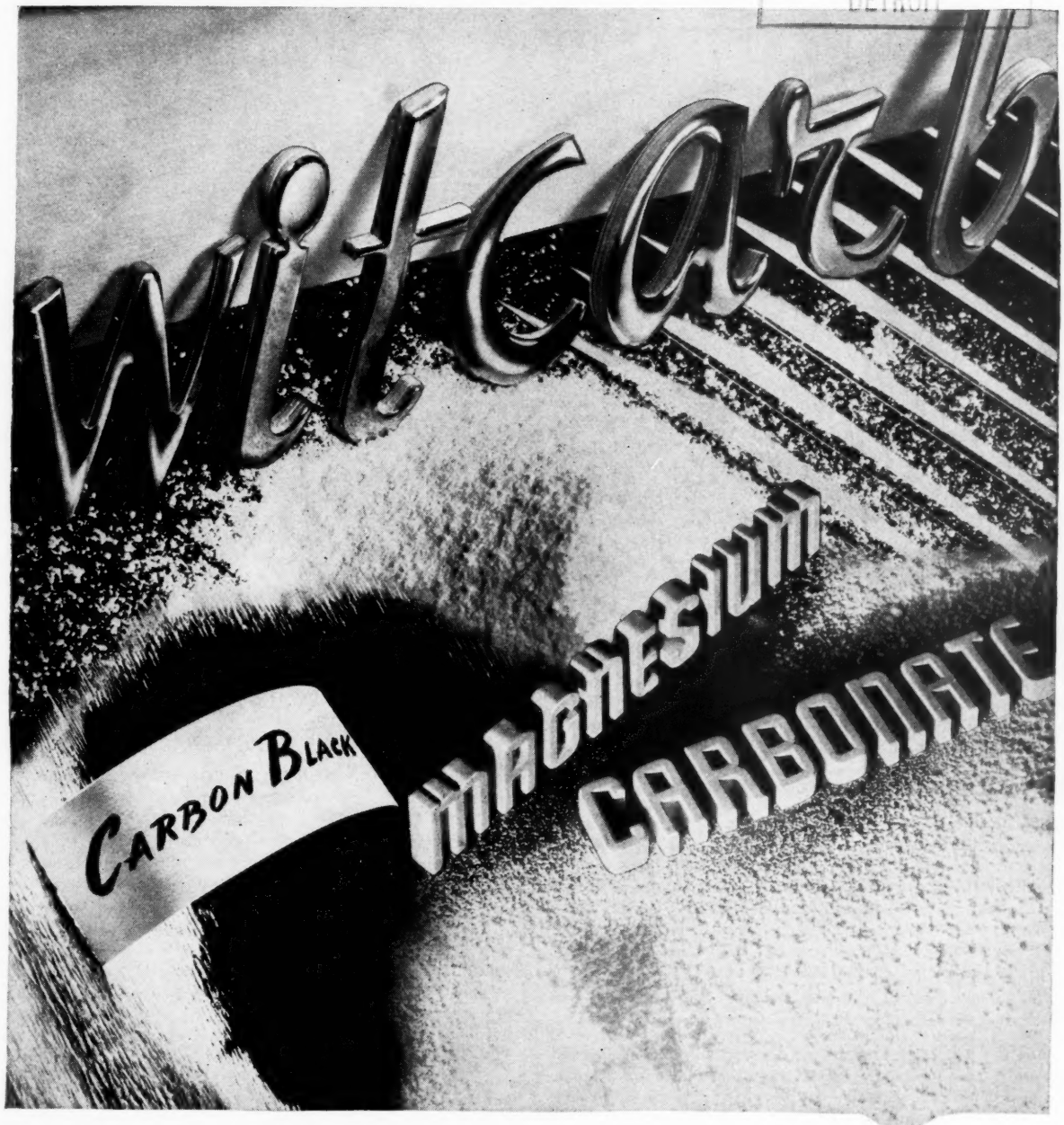
RUBBER CHEMICALS DIVISION

Wilmington, Delaware

India Rubber World, January 1, 1942, Vol. 105, No. 4. Published monthly by Bill Brothers Publishing Corp., 420 Lexington Avenue, New York, N. Y., U. S. A. Entered as second class matter October 5, 1889, at the Post Office at New York, N. Y., under the act of March 3, 1879. Subscription, $3.00 a year domestic; Mexico, $3.50; all others, $4.00; single copies, 35 cents.

TECHNOLOGY DEPT.

PUBLIC LIBRARY
JAN 12 1942
DETROIT



DEPEND upon Witco Carbon Blacks to give you consistently fine results in rubber compounding—high modulus, high tensile, good dispersion, resistance to abrasion, and stability in rate of cure. There is a Witco Black for every formulating purpose. Witcarb is a specially developed white reinforcing filler for use in formulas that demand high tensile and modulus and tear resistance. Witco Magnesium Carbonate will also give you quality results in various applications—it is one of the most transparent products of this type available. Fill out and mail the coupon for more complete information on these and other Witco materials.

WISHNICK-TUMPEER, INC.

MANUFACTURERS AND EXPORTERS

New York, 295 Madison Ave. • Boston, 141 Milk St. • Chicago, Tribune Tower • Cleveland, 616 St. Clair Ave., N. E. • Witco Affiliates: Witco Oil & Gas Company • The Pioneer Asphalt Company • Panhandle Carbon Company • Foreign Office, London, England

WISHNICK-TUMPEER, INC.
295 Madison Avenue, New York, N. Y.

Gentlemen: Please send me a free copy of WITCO PRODUCTS. I am interested in the following:

- ☐ Witco Carbon Blacks
- ☐ Witco Magnesium Carbonate
- ☐ Witco Witcarb

Name_____ Title_____

Firm_____

Address_____

City_____ State_____

Dept. E

Defense Savings Pay-Roll Allotment Plan

How company heads can help their country, their employees, and themselves

voluntary pay-roll allotment plan

helps workers provide for the future

helps build future buying power

helps defend America today

This is no charity plea. It is a sound business proposition that vitally concerns the present and future welfare of your company, your employees, and yourself.

During the post-war period of readjustment, you may be faced with the unpleasant necessity of turning employees out into a confused and cheerless world. But you, as an employer, can do something *now* to help shape the destinies of your people. Scores of business heads have adopted the Voluntary Pay-roll Allotment Plan as a simple and easy way for every worker in the land to start a *systematic* and *continuous* Defense Bond savings program.

Many benefits . . . present and future. It is more than a sensible step toward reducing the ranks of the post-war needy. It will help spread financial participation in National Defense among all of America's wage earners.

The widespread use of this plan will materially retard inflation. It will "store" part of our pyramiding national income that would otherwise be spent as fast as it's earned, increasing the demand for our diminishing supply of consumer goods.

And don't overlook the immediate benefit . . . money for defense materials, quickly, continuously, *willingly*.

Let's do it the American way! America's talent for working out emergency problems, democratically, is being tested today. As always, we will work it out, without pressure or coercion . . . in that old American way; each businessman strengthening his *own* house; not waiting for his neighbor to do it. That custom has, throughout history, enabled America to get things done *of its own free will*.

In emergencies, America doesn't do things "hit-or-miss." We would get there *eventually* if we just left it to everybody's whim to buy Defense Bonds when they thought of it. But we're a nation of businessmen who understand that the way to get a thing done is to *systematize* the operation. That is why so many employers are getting back of this Voluntary Savings Plan.

Like most efficient systems, it is amazingly simple. All you have to do is offer your employees the convenience of having a fixed sum allotted, from each pay envelope, to the purchase of Defense Bonds. The employer holds these funds in a separate bank account, and delivers a Bond to the employee each time his allotments accumulate to a sufficient amount.

Each employee who chooses to start this savings plan decides for himself the denomination of the Bonds to be purchased and the amount to be allotted from his wages each pay day.

How big does a company have to be? From three employees on up. Size has nothing to do with it. It works equally well in stores, schools, publishing houses, factories, or banks. This whole idea of pay-roll allotment has been evolved by businessmen in cooperation with the Treasury Department. Each organization adopts its own simple, efficient application of the idea in accordance with the needs of its own set-up

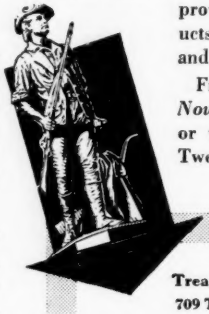
No chore at all. The system is so simple that A. T. & T. uses exactly the same easy card system that is being used by hundreds of companies having fewer than 25 employees! It is simple enough to be handled by a check-mark on a card each pay day.

Plenty of help available. Although this is *your* plan when you put it into effect, the Treasury Department is ready and willing to give you all kinds of help. Local civilian committees in 48 States are set up to have experienced men work with you just as much as you want them to, and no more.

Truly, about all *you* have to do is to indicate your willingness to get your organization started. We will supply most of the necessary material, and no end of help.

The first step is to take a closer look. Sending in the coupon in no way obligates you to install the Plan. It will simply give you a chance to scrutinize the available material and see what other companies are already doing. It will bring you samples of literature explaining the benefits to employees and describing the various denominations of Defense Savings Bonds that can be purchased through the Plan.

Sending the coupon does nothing more than signify that you are anxious to do *something* to help keep your people off relief when defense production sloughs off; *something* to enable *all* wage earners to participate in financing Defense; *something* to provide tomorrow's buying power for your products; *something* to get money *right now* for guns and tanks and planes and ships.



France left it to "hit-or-miss" . . . and *missed*. *Now* is the time for *you* to act! Mail the coupon or write Treasury Department, Section A, 709 Twelfth St. NW., Washington, D. C.

FREE - NO OBLIGATION

Treasury Department, Section A,
709 Twelfth St. NW., Washington, D. C.

Please send me the free kit of material being used by companies that have installed the Voluntary Defense Savings Pay-Roll Allotment Plan.

Name _____

Position _____

Company _____

Address _____

GPO 127922

We have 3 customers

THE ARMY...THE NAVY...AND YOU

They are also *your* customers. Your rubber products must give maximum service to conserve the rubber supply.

Naugatuck Chemical manufactures a full line of superior chemical products for the rubber industry. We are doing everything possible to maintain this supply. And we will do all we can to maintain and improve that quality of product and of service that led You to give us so much of your business in the past.

Naugatuck Chemical

DIVISION OF UNITED STATES RUBBER COMPANY
ROCKEFELLER CENTER NEW YORK, N. Y.

CALCENE

MAKES RUBBER GO FARTHER

Calcene is a re-inforcing Calcium Carbonate pigment of extremely fine particle size. For eight years it has proved its value in making a limited quantity of rubber go farther in terms of finished goods. With today's rationing of rubber, Calcene can be more useful to you than ever.

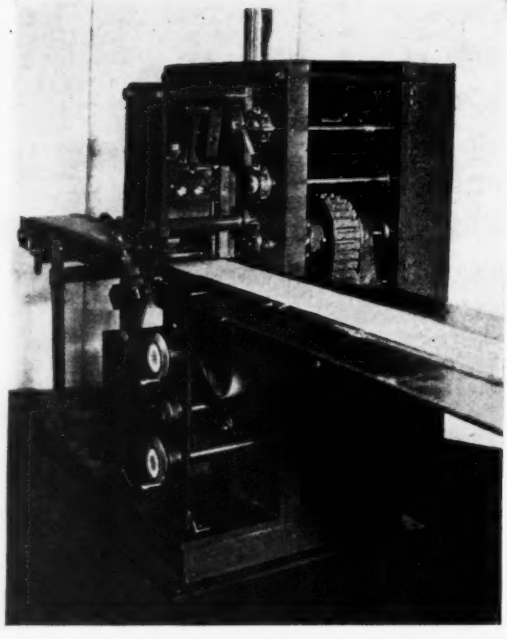
Among virtually all the materials in its class, Calcene can be loaded at the highest volume with the least deterioration in physical properties. It assures highly loaded stock of low volume cost but with excellent resistance to tear, abrasion and flex cracking.

As supplementary fillers for stiff stocks we suggest the use of clay along with Calcene. For better grade stocks, Silene is recommended.

PITTSBURGH
PLATE GLASS COMPANY
Columbia Chemical Division

30 Rockefeller Plaza, New York, N. Y.

Chicago Boston St. Louis
Pittsburgh Cincinnati Cleveland
Minneapolis Philadelphia Charlotte



Utility Cutter

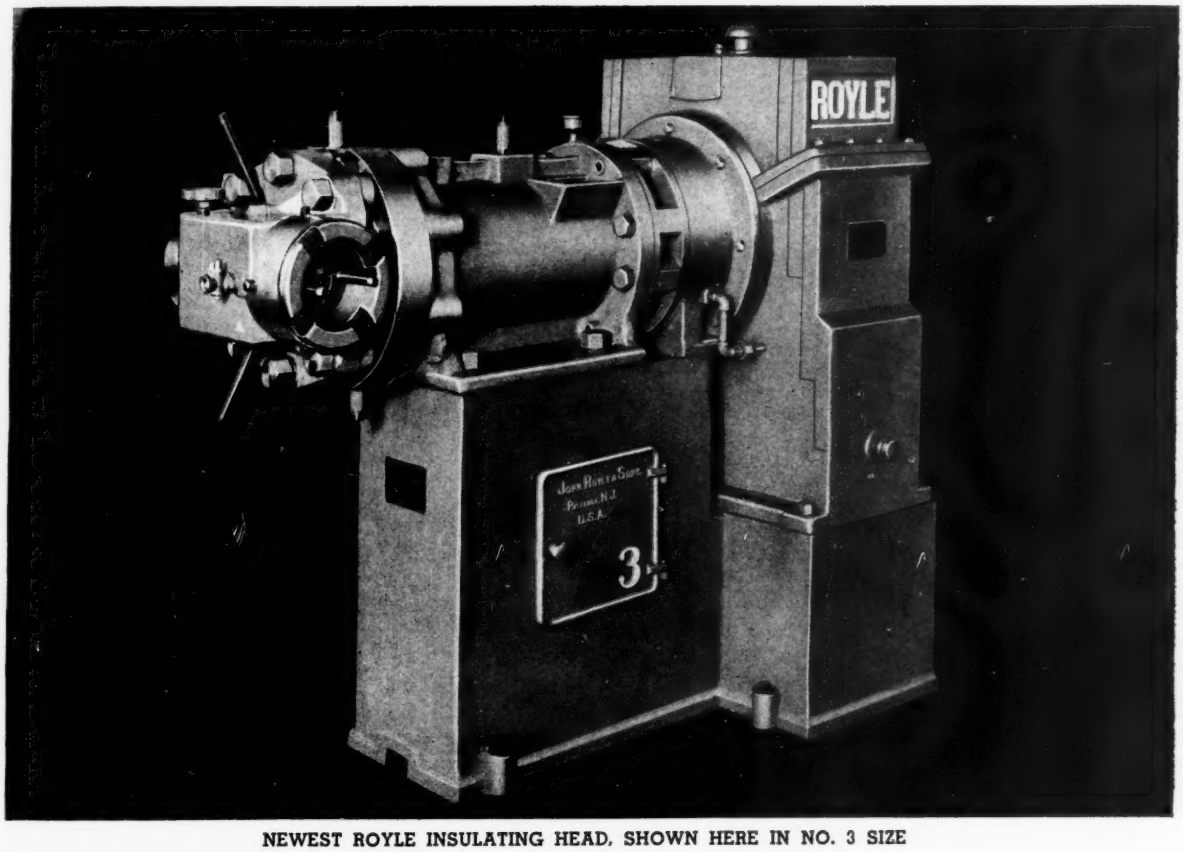
Designed to measure and cut stocks to length as they leave the tuber.

Consult us on your cutting problems.

UTILITY MANUFACTURING COMPANY
CUDAHY, WISCONSIN

CABLE ADDRESS
UTILITY—MILWAUKEE

LONG DISTANCE PHONE
CALL MILWAUKEE—SHERIDAN 7020



NEWEST ROYLE INSULATING HEAD, SHOWN HERE IN NO. 3 SIZE

THE CONSUMERS SIDE *of the* QUESTION

Runners often stop breathing during the closing seconds of a race—sprinting towards the tape upon pure nerve alone.

This has been much the condition of America in our defense effort but everyone knows that this condition must be temporary. Normal production and consumption of non-essential goods are the breathing that keeps this nation strong.

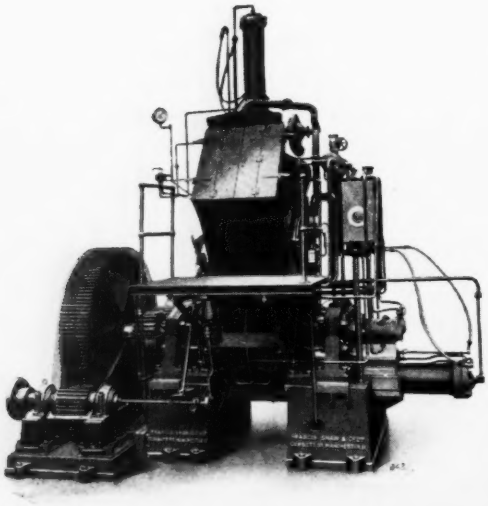
Until the sprint is over, we pledge fair and equitable service to our good friends and customers. When conditions approach normalcy, we promise a renewal of the service that has fostered so many warm business friendships throughout industrial America. Won't you bear with us?

John Royle & Sons *Since 1855*

ROYLE PATERSON N J

AKRON, J. C. CLINEFELTER • LOS ANGELES, LOMBARD SMITH CO. • LONDON, JAMES DAY (MACHINERY) LTD.

ROYLE'S 62 ND. YEAR OF EXTRUDING MACHINE MANUFACTURE



BOTH TECHNICALLY AND MECHANICALLY

The SHAW INTERMIX

IS THE MASTER MIXER

TECHNICAL MERITS . . . .

- Designed in co-operation with leading rubber technologists to give maximum dispersion and stocks of better quality.
- Patented rotors improve the mixing to such a degree that it is possible to follow closely to laboratory formulae with complete satisfaction.
- Efficient cooling, because every part in contact with the mix is water-cooled.
- Easily handled and controlled by operatives, giving more uniform and greater outputs—in fact better mixing for less cost.

MECHANICAL FEATURES . . . .

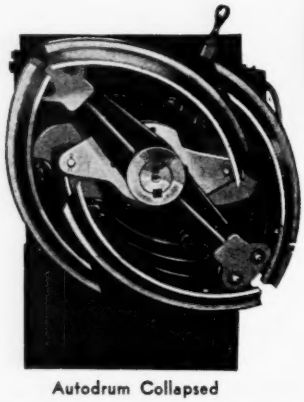
- Roller bearings effect important savings in power costs.
- Machine-cut gears of great accuracy ensure silent running.
- Renewable chamber will save costly repairs.
- Scientifically designed glands, with mechanical lubrication, give dustless running.
- Generous design in every part gives longest life and fewest maintenance charges.

FRANCIS SHAW

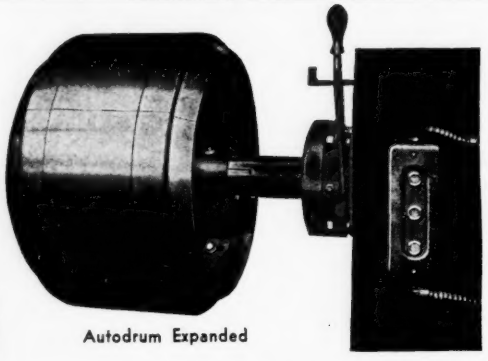
AND COMPANY LIMITED

MANCHESTER 11, ENGLAND

ARE YOU ADEQUATELY EQUIPPED TO MANUFACTURE ALL SIZE TIRES FROM 10" to 40" INCLUSIVE?



Autodrum Collapsed



Autodrum Expanded

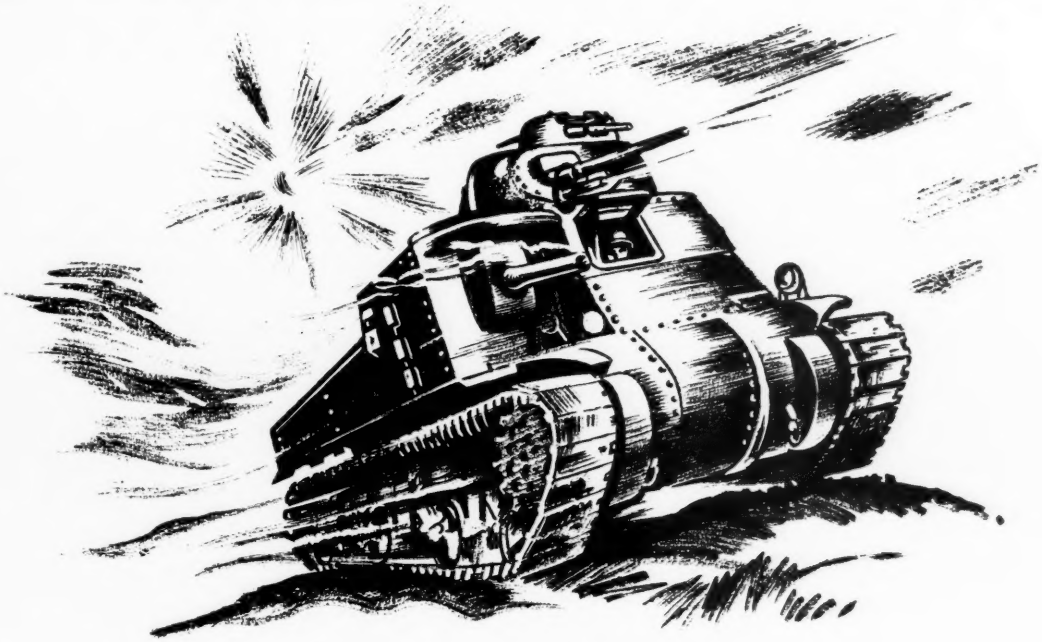
As usual our AUTODRUMS have made good on all these sizes and for Truck Tires, Tractor Tires and Airplane Tires, too!! They are the most economical, efficient drums on the market today.

Check up now, and if you are not adequately equipped with these size AUTO-DRUMS, mail your order at once.

The Akron Standard Mold Co.

Akron "The Established Measure of Value" **Ohio**

Represented in foreign countries, except Canada, by BINNEY & SMITH CO., 11 E. 42nd St., New York, N. Y.



Yes, we are Prepared!

No matter how exacting in quality and quantity your scrap rubber requirements may be, we are prepared to give you full co-operation, whether it be Hard Rubber Dust or any of the various grades of Scrap Rubber, regardless of colors.

Our 40 years of experience in the rubber industry have fitted us to function smoothly and surely. We keep our fingers on the pulse of the industry and know exactly where to obtain the stocks demanded.

You'll find us ready at your call to discuss and fill your requirements of any of the very diverse material demands made by your special manufacturing processes.

Scrap RUBBER

H. MUEHLSTEIN
& COMPANY, INCORPORATED

122 EAST 42nd STREET NEW YORK, N. Y.

BRANCHES

Chicago Los Angeles Boston Akron Memphis London

REPLACE FATTY ACIDS

WITH
PARA LUBE + SL-20
(EQUAL PARTS)

YOU GET A BETTER LOOKING PRODUCT AND MORE CURES PER MOLD CLEANING

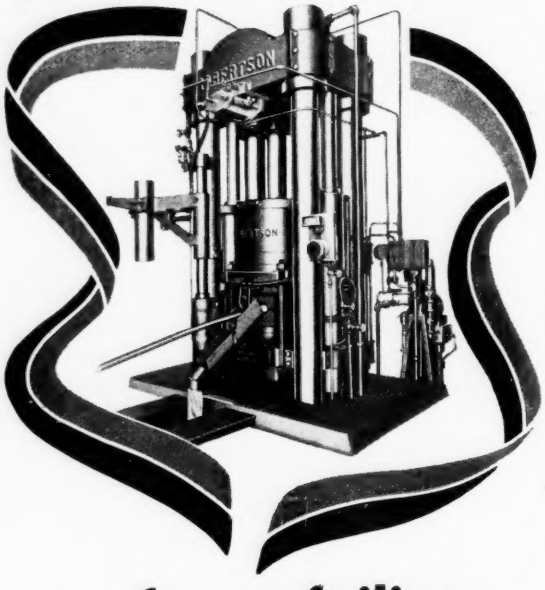
Equal parts of Para Lube and SL-20 is a C. P. Hall development that does the job of fatty acids ***better*** and ***more economically.***

Such a significant improvement in the manufacture of molded rubber products surely deserves your attention.

The C. P. Hall Company invites you to test this formula in your own plant or laboratory. See how PARA LUBE + SL-20 cuts costs . . . insures cleaner and quicker knockout . . . gives maximum number of cures per mold cleaning!

The C. P. Hall Co.
CHEMICAL MANUFACTURERS
AKRON • BOSTON • LOS ANGELES • CHICAGO

DECORATED



. . . for unfailing service in the face of heavy duty

Built with an eye to the future, this famous press (It's used by the majority of leading hose producers) is giving the very minimum operating and maintenance costs — while maintaining the most exacting production rate.

If you can use service like this, a note on your letterhead brings details . . . without obligation.

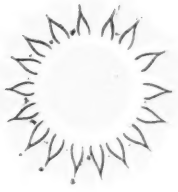
ROBERTSON LEAD ENCASING PRESS

Also HYDRAULIC PRESSES • HIGH PRESSURE HYDRAULIC PUMPS • CLOSED LEAD MELTING POTS

JOHN ROBERTSON CO., INC.
131 Water St., Brooklyn, N.Y.

For Some Uses... Better than The Originals

Electric Bulb... 

Man-Made Alternate for the Sun 

Nylon... 

Man-Made Alternate for Silk 

DISPERSITE... 

Man-Made Alternate for Latex 

Dispersions Process, Inc.

ROCKEFELLER CENTER NEW YORK

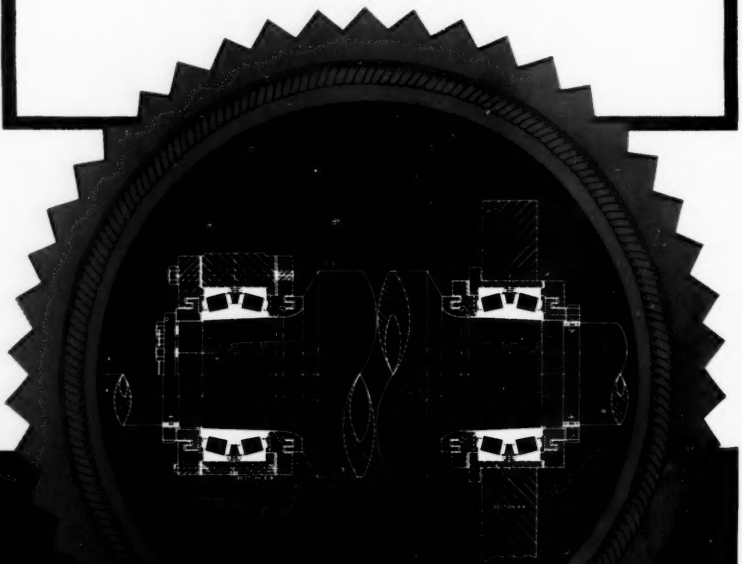
LOOK AHEAD!

After the war--severe competition for rubber markets. Cut costs, maintain quality with new machinery fully Timken Bearing Equipped.

Rubber manufacturing machines equipped with Timken Bearings are doing a wonderful job in assuring a plentiful supply of this vital material for America's war needs. Whether they will have the speed, precision and operating economy necessary to meet post-war demands is another question and one equipment manufacturers and users should be pondering now.

Profits probably will be elusive—but you can be sure of one thing; the more Timken Bearings any machine has, the more capable it will be in combating the changed conditions. Machines that are completely Timken Bearing Equipped will give their operators a tremendous advantage. Make this a point when buying new equipment.

THE TIMKEN ROLLER BEARING CO., CANTON, O.



Typical application of Timken Bearings to rubber mill rolls. Shaft and roll assemblies are held in accurate relationship, permitting efficient bearing closures; leakage is prevented; lubricant saved; contamination stopped. Initial roll setting is retained indefinitely, assuring positive and uniform control of the space between the rolls —a particularly valuable advantage.

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

Manufacturers of Timken Tapered Roller Bearings for automobiles, motor trucks, railroad cars and locomotives and all kinds of industrial machinery; Timken Alloy Steels and Carbon and Alloy Seamless Tubing; and Timken Rock Bits.

THE STORY OUR ADVERTISEMENTS DO NOT TELL

The advertisements of The New Jersey Zinc Company which are appearing currently in these pages explain the reasons why non-defense consumers have not been able to obtain all of the zinc they would like to have.

At the close of a critical business year, however, The New Jersey Zinc Company feels that it should tell a story which would not normally be a part of such a series of advertisements—a story of the cooperation given to this Company by its customers.

This cooperation, and the resulting exchange of vital information, made possible:

A better understanding of our mutual problems and difficulties;

The elimination of unreasonable demands and unfilled promises;

The fulfillment of contract obligations in spite of a tremendous expansion of business;

The shipment of a large list of zinc products where and when they were needed most—in defense and non-defense fields.

Consequently, thanks to our customers' cooperation and understanding, we feel that a difficult task has been accomplished.

The New Jersey Zinc Company looks forward to 1942 with confidence that this cooperation—which has proved of the greatest value under a heavy strain—will continue to operate to the mutual advantage of all concerned.

160 FRONT STREET — New Jersey Zinc Co. — NEW YORK, N. Y.

Shamva

Trade Mark Reg. U. S. Pat. Off.

WHITE HEAVY CALCINED MAGNESIA

Manganese Free

The unusually high quality of Shamva Heavy Calcined Magnesia as an accelerator is one more step in the direction of a purer finished rubber product. Shamva is "built up" from a *natural* base of selected quality ores which are Manganese free—an assurance before hand of results which will be in accordance with accepted manufacturing standards.

In one grade only. Limited quantities available for immediate shipment. Samples on request.

GOLWYNNE
CHEMICALS CORPORATION
420 LEXINGTON AVENUE • NEW YORK, N. Y.

Stauffer
CHEMICALS
SINCE 1885

RUBBER SULPHURS

COMMERCIAL RUBBERMAKERS' SULPHUR

Tire Brand, 99½% Pure

REFINED RUBBERMAKERS' SULPHUR

Tube Brand, 100% Pure

•

CRYSTEX (INSOLUBLE) SULPHUR

•

SULPHUR CHLORIDE
CAUSTIC SODA
CARBON BISULPHIDE
CARBON TETRACHLORIDE

Stauffer Chemical Co.

420 LEXINGTON AVE., NEW YORK, N. Y.
230 NO. MICH. AVE., CHICAGO, ILL.
624 CALIFORNIA ST., SAN FRANCISCO, CAL.
555 SO. FLOWER ST., LOS ANGELES, CAL.
424 OHIO BUILDING, AKRON, OHIO
FREEPORT, TEXAS APOPKA, FLORIDA

1942

BRINGS TO THE

RUBBER INDUSTRY OF AMERICA

THE NEW REVOLUTIONARY

NERVASTRAL RECLAIMING PROCESSES

■

HIGH GRADE
HIGH SPEED
HIGH ECONOMY

■

RUBBER & PLASTICS COMPOUNDS COMPANY, INC.
30 ROCKEFELLER PLAZA **NEW YORK**

CABLE ADDRESS
"RUBCOPLA" NEW YORK

TELEPHONE
COLUMBUS 5-0085

The right way to save rubber

There is one right way for a manufacturer to save rubber. Simply to "load" the compound with a lot of filler won't do the trick. In the manufacturing end this causes excessive scrap, and in use, products don't stand up.

True savings result when all the ingredients in a compound are correctly apportioned and blended. Scrap rubber then is minimized, and the resultant product gives long service.

This is *real* conservation.

DAVOL RUBBER COMPANY
PROVIDENCE RHODE ISLAND

ROBERT BADENHOP CORPORATION

CRUDE RUBBER

GUTTA PERCHA **GUTTA SIAK**
LIQUID LATEX **BALATA**
PURIFIED (Low Moisture Absorption) CREPE

Product of Netherlands East Indies Government Estates, Java

WOOLWORTH BLDG. (TEL. CORTLAND 7-6920) NEW YORK, N.Y.

THE WORLD'S FINEST RUBBER AND PLASTIC MACHINERY

AMCO ESTABLISHED 1892

The **ADAMSON MACHINE Co.**

AKRON, OHIO . . . U. S. A.

Adamson mixing and molding equipment is built to meet modern production demands for greater accuracy at lower costs. What's your machine problem? A card will bring full particulars. Write today!

Keystone View Co.

WATERPROOF FOOTWEAR COMFORT

Enhanced by GASTEX and PELLETEX

No GASTEX in these shoes, picturesque but—?

It is often said that the luxuries of yesterday have become the necessities of today. The fact that some few always retain the provincial customs of the past keeps us from taking for granted the great advantages we enjoy over the poorer enrichments of our grandparents.

The light-weight comfort and extreme serviceability of modern rubber overshoes, the live-buoyance of rubber heels and the rugged utility of rubber soled sport shoes need no sponsors in proving their superiority over the heavy, cumbersome footwear of the low countries.

In this welcome development, the special process blacks GASTEX and PELLETEX have played no small part. These popular pigments have been found ideal by technicians in achieving style, pliancy and long wear without excessive weight. GASTEX and PELLETEX footwear compounds produce overshoes, boots, soles and heels remarkable for their flexibility, resilience, aging properties and freedom from cracking. If rubber restrictions make it impossible to produce footwear for civilian use during the present emergency, remember that GASTEX and PELLETEX will be ready whenever production is resumed.

Technical bulletins on the subject will be sent when request is made on firm letterhead.

GENERAL ATLAS CARBON DIVISION

OF GENERAL PROPERTIES COMPANY, INC.

GASTEX TRADE MARK

SIXTY WALL STREET, NEW YORK, N. Y.

Plants: Pampa, Tex.; Guymon, Okla.

PELLETEX TRADE MARK

SALES REPRESENTATIVES

ERNEST JACOBY & CO.
Boston

THE C. P. HALL CO. OF CALIF.
Los Angeles

HERRON & MEYER
Akron • New York • Chicago

H. M. ROYAL, INC.
Trenton, N. J.

ST. LAWRENCE CHEMICAL CO., LTD.
Toronto • Montreal

BARCO

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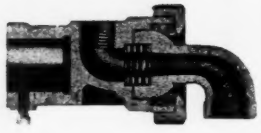

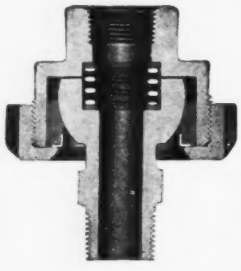

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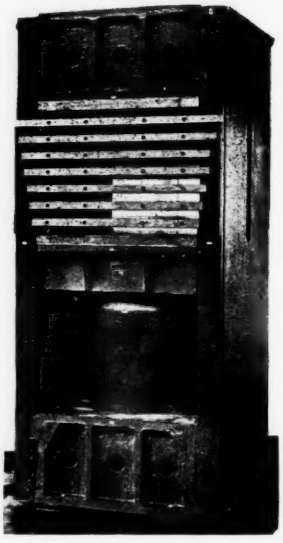

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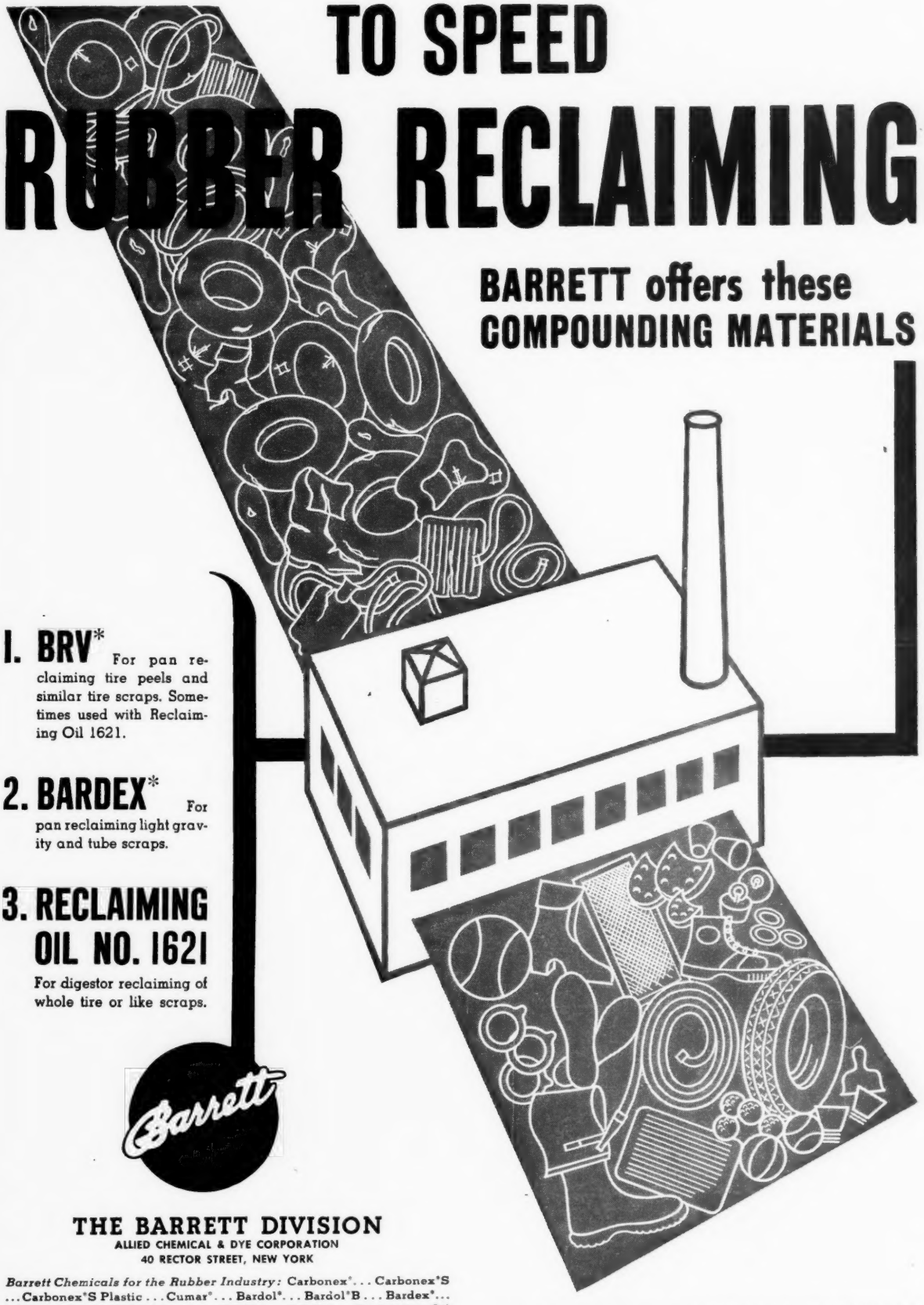

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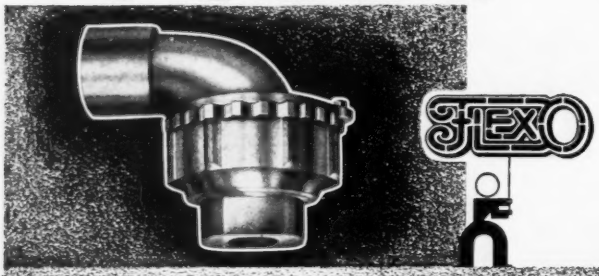

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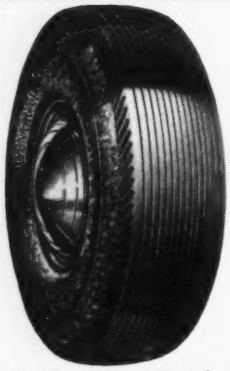

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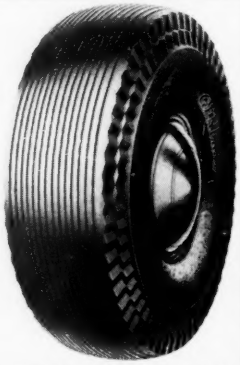

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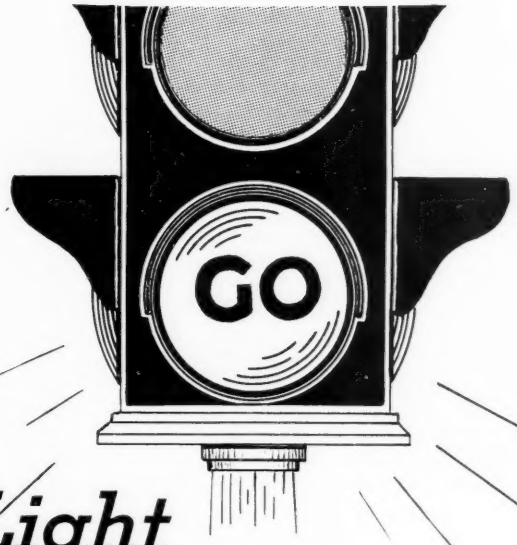

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Rubber in Shear

Ellipse of Component Strains

Elmer Latshaw[1]

A WELL-KNOWN type of rubber spring is illustrated in Figures 1 and 2. Here we have rubber bonded to parallel metal plates. The motion of one plate in a direction parallel to the other subjects the rubber to a shearing stress; hence this spring is called a shear spring. The broken end lines indicate the deflection D, and the full lines the unstressed end boundary.

When the spring is deflected, as indicated in Figures 1 and 2, it is usually said to be sheared equally all over the area. This is not true, but only an approximation, since a shear stress must vanish at a horizontal end boundary and vary in some manner for other end shapes. In order to study pure shear, we will now refer to Figure 3 where is shown but a small portion of an infinitely deep unit. In this way the end effects may be disregarded, and the shear assumed to be uniform over the portion under consideration.

In Figure 3, $ABCD$ represents an unstressed element, and $AB'C'D$ the same element when deflected in shear an amount D. Since the area of this element, whether unloaded or stressed, equals the base multiplied by the thickness, it is apparent that there is no area change required for a pure shearing stress. By definition, pure shear involves no stresses perpendicular to the view shown.

An important characteristic of rubber is its very high bulk modulus compared to the shear modulus. For a compound with $G = 67$ shear modulus, we have a bulk modulus of about 400,000 pounds per square inch. This indicates rubber to be relatively non-compressible; so the volume can be assumed constant regardless of the stress present. While it was shown above that pure shear called for no area change, consequently no change in volume, we now see that constant volume is a basic property of rubber in shear.

Figure 4 shows a small portion of a very deep unit deflected in shear an amount $D = Kt$. An unstressed element of length h will be stretched to H, hence stressed

[1] Railway truck engineer, J. G. Brill Co., Philadelphia, Pa.

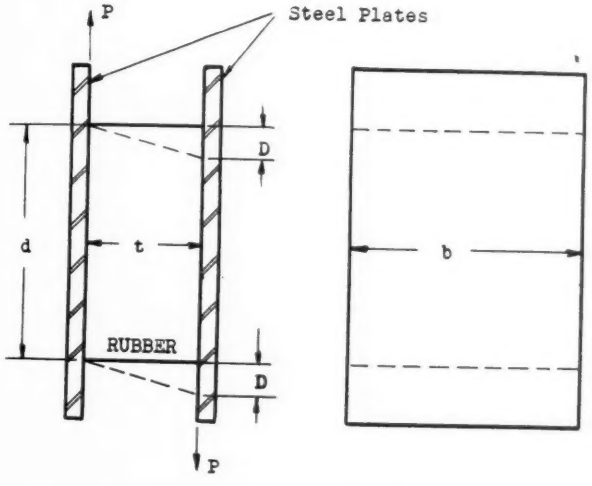


Fig. 1. Shear-Type Rubber Spring. The Unstressed Rubber Section Is a Rectangle

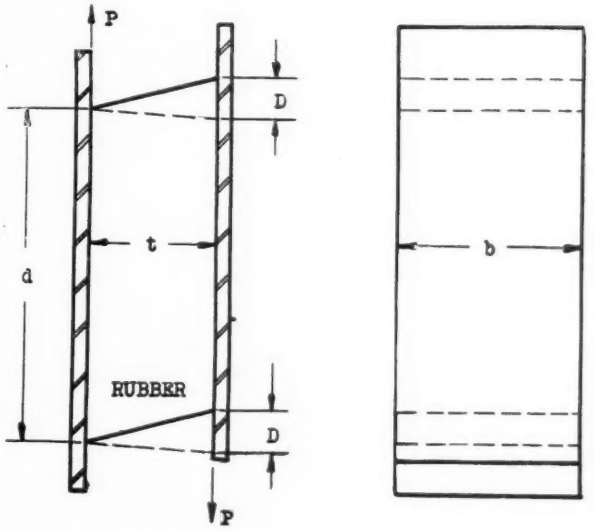


Fig. 2. Shear-Type Rubber Spring. The Unstressed Rubber Section Is a Parallelogram

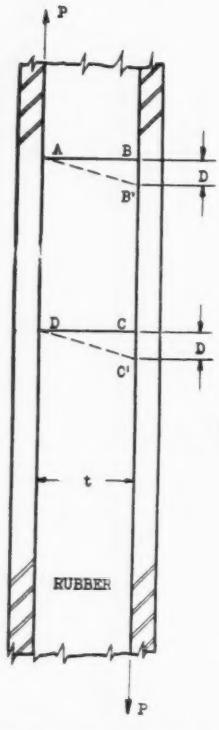


Fig. 3. Element of a Rubber Spring Illustrating That the Sectional Area Is Unchanged by Pure Shear

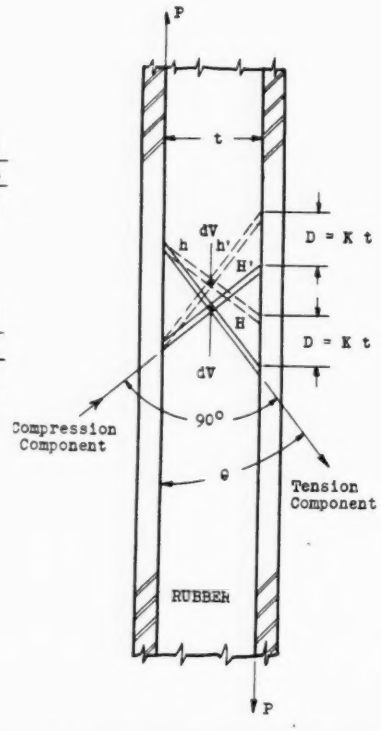


Fig. 4. Element of a Shear Type of Rubber Spring Showing Strips Which Are Subjected to Tension and Compression Strain Components

in tension. Likewise, we have unstressed element h' shortened to H' or under compression.

Now let $R = H/h$ Tensile strain ratio (1)

and $R' = H'/h'$ Compression strain ratio (2)

The strain ratio R is defined as the stressed length divided by the unstressed length. Hence values greater than unity indicate a tension component; unity denotes zero stress, and values from unity to zero a compression stress component. In this study we will deal with the strain ratio for the tension and compression components which accompany shear. No attempt will be made to evaluate these stresses. However it will be shown that these components follow an elliptical pattern.

Again referring to Figure 4, we will derive the angle Θ that the principal tensile and compressive strain ratio components make with the plates for a given shear deflection. Since the volume remains unchanged, when stressed, we have:

Unstressed $dV = b\,dh\,dh'$ (3)

Stressed $dV = b\,dH\,dH'$ (4)

Hence $dh\,dh' = dH\,dH'$ (5)

or $h\,h' = H\,H'$ For uniform stress (5)a

Setting up (5)a in trigonometric form gives:

$$\sec^2\Theta \csc^2\Theta = [(\cot\Theta - K)^2 + 1]\,[(\tan\Theta + K)^2 + 1] \quad (6)$$

or $K = \cot\Theta - \tan\Theta$ (7)

or $K = 2\cot 2\Theta$ (8)

The result based on the principle of non-changing volume under stress is given by (7) or (8). However this is not a rigorous proof that the component strain ratio is a maximum. This can be demonstrated more clearly by referring to Figure 5 for the tension component; thus:

$$R = \frac{H}{h} = \frac{\csc\Theta}{[(\cot\Theta - K)^2 + 1]^{.5}} \quad (9)$$

but $dR/d\Theta = 0$ For a maximum

Differentiating (9), equating to zero and solving gives:

$K = \cot\Theta - \tan\Theta$ Same as (7)

Hence, we have proved that (7) gives the angle Θ made by the maximum tensile strain ratio line. If (7) is substituted in (9), we get the maximum value, or:

$$Rx = \frac{\csc\Theta}{\sec\Theta} = \cot\Theta \quad \text{Maximum tension} \quad (10)$$

It is also of interest to note that the angle A, or the direction of the unstressed line, can be defined. See Figure 5.

$$\tan A = t/(t\cot\Theta - K\,t) \quad (11)$$

and using (7) for K gives:

$$\tan A = 1/\tan\Theta = \cot\Theta \quad (12)$$

By (12) we see that the unstressed angle A is the compliment of the stressed angle Θ.

Thus $\Theta + A = 90°$ (13)

We will next prove that (7) also gives the minimum strain ratio for the compression component. See Figure 6.

$$R' = \frac{H'}{h'} = \frac{\sec\Theta}{[(\tan\Theta + K)^2 + 1]^{.5}} \quad (14)$$

But $dR/d\Theta = 0$ For a minimum

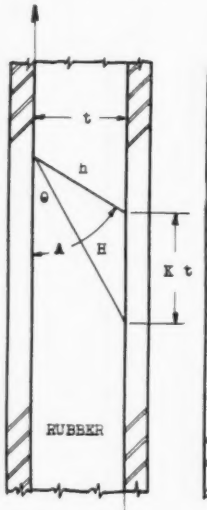


Fig. 5. Principal Tension Component Strain Ratio Line for Pure Shear

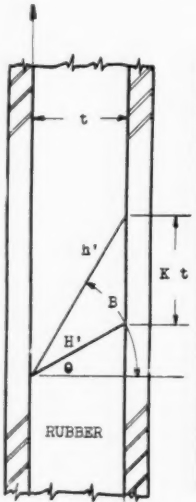


Fig. 6. Principal Compression Component Strain Ratio Line for Pure Shear

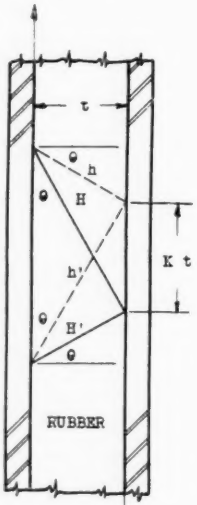


Fig. 7. Right Triangles of Principal Strain Ratios. Under Pure Shear the Dotted Triangle Is Distorted to the Full Lined Triangle

It should be noted that for compression a minimum strain ratio denotes a maximum stress.

Differentiating (14), equating to zero and solving thus gives:

$$K = \cot\Theta - \tan\Theta \qquad \text{Same as before in (7)}$$

Using (7) in (14) yields:

$$Rn = \frac{\sec\Theta}{\csc\Theta} = \tan\Theta \qquad \text{Minimum compression} \qquad (15)$$

Now we can write the angle B made by the unstressed compression line:

$$\tan B = (t\tan\Theta + K\,t)\,/\,t \qquad (16)$$

And using (7) for K gives

$$\tan B = \cot\Theta \qquad (17)$$

Or B and Θ are complementary.

$$\text{Thus} \quad \Theta + B = 90^\circ \qquad (18)$$

By (10) and (15) it is evident that the maximum or principal tension strain ratio is the reciprocal of the minimum or principal compression strain ratio.

$$Rx = \cot\Theta = 1\,/\,Rn = 1\,/\,\tan\Theta \qquad (19)$$

It will be instructive to draw Figure 7, which is a combination of Figures 5 and 6. The broken lines form a right angle triangle and represent the unstressed lines for tension and compression. The solid triangle shows the new positions taken when sheared to Kt, and the maximum strain ratios can be readily seen.

Thus far only the greatest and least values of component strain ratios have been evaluated and located. To study the manner in which they vary at other points reference is made to Figure 8. First, a circle is drawn of unity radius, which represents a zone of rubber where the shear stress is zero. If the zone of rubber is now subjected to shear in the direction of the vertical center line, the maximum tension strain ratio will occur along the diagonal, making an angle Θ with the vertical: also the minimum compression value will be disposed 90° from it.

The coordinates for point o on the unstressed circle are x and y. For uniform shear, point o is shifted to O with coordinates X and Y.

$$\text{Hence} \qquad X = Rx\ x \qquad (20)$$

$$Y = Rn\ y = Rx^{-1}\ y \qquad (21)$$

$$x^2 + y^2 = 1 \qquad \text{Equation of unstressed unit circle} \qquad (22)$$

and

$$\frac{X^2}{Rx^2} + \frac{Y^2}{Rn^2} = 1 \qquad \text{Equation of stressed circle} \qquad (23)$$

But (23) is recognized as the equation of an ellipse. The radius vector R for any point O on the ellipse is the strain ratio disposed by an angle U from the maximum tension line. By the following work a general equation for R can be derived.

By Figure 8 we see that:

$$X = R\cos U \qquad (24)$$

$$Y = R\sin U \qquad (25)$$

By (21), (24) and (25) combined in (23) gives:

$$X^2 + Rx^4\,Y^2 = Rx^2 \qquad (26)$$

and

$$R^2\cos^2 U + R^2 Rx^4 \sin^2 U = Rx^2 \qquad (27)$$

or

$$R = \frac{Rx}{(Rx^4\sin^2 U + \cos^2 U)^{.5}} \qquad \text{General} \qquad (28)$$

when $U = O \quad R = Rx$

when $U = \Theta \quad R = 1$ See point p Figure 8

when $U = 90^\circ \quad R = 1\,/\,Rx = Rn$

Thus we have derived a general strain ratio equation (28) which holds for all values of U. It describes the tension region included by an angle $(2\ \Theta)$ and values greater than unity. It also gives the compression region which is $(180^\circ - 2\ \Theta)$ and indicated by values less than unity. Point p, or rather, the radius vector through p and the vertical line through q are the two planes with unity strain ratio corresponding to zero component stress.

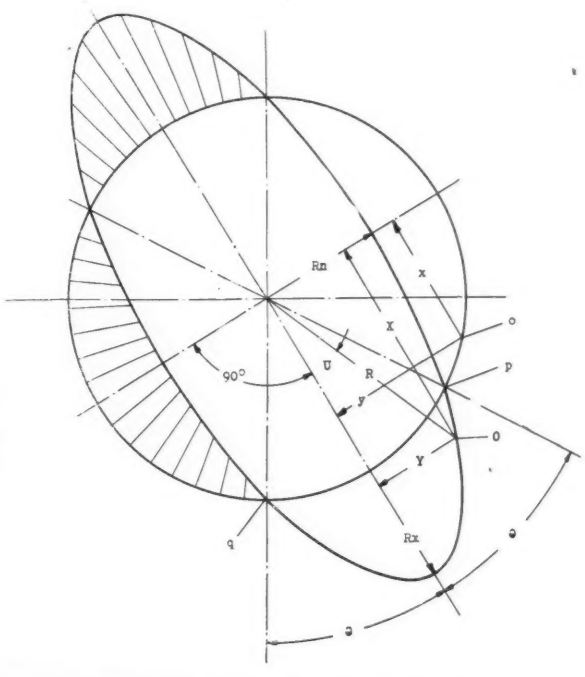


Fig. 8. The Radius Vector of the Ellipse Represents the Component Strain Ratio Present in Pure Shear. The Shaded Lobes Graphically Indicate Tension and Compression Component Stresses

Since stress depends on strain, or $(R-1)$, the shaded lobes give a graphic picture of the component stresses. Exterior lobes indicate tension, and interior lobes compression components. The specific values of component stresses will not be derived here.

This elliptical diagram can easily be produced on a specimen stressed in shear. First, draw the unit circle; then subject the rubber to shear, and draw a second unit circle from the same center. The first circle will now be altered to an ellipse as shown in Figure 8. If the shear stress is now removed, the circle and ellipse interchange in position, and a permanent record is preserved except for the axis being shifted 90°. This makes it convenient to study the strain ratio ellipse even after the load is removed. By careful measurement for the location of point p we can accurately evaluate angle $(2\,\Theta)$ and thereby check the theory on which the work is based.

Farrel-Birmingham Opens New Testing Laboratory

AS AN aid to industry in the development of new processes and materials, Farrel-Birmingham Co., Inc., Ansonia, Conn., has expanded the testing facilities at its Derby plant by completely reequipping the laboratory that it has operated there for some years.

Purpose

The laboratory is not intended to compete with established commercial laboratories, but is operated solely for the purpose of aiding the company's present and prospective customers to develop new products or improve old ones, with the view that expanded use of these products will create a greater need of the machinery built by the company.

The new laboratory was started about August 1, 1941, and since that date an average of three independent companies a week has made use of the testing facilities. The laboratory has been found particularly valuable at this time by manufacturers who are endeavoring to substitute materials and processes for those made difficult or impossible to secure because of the priorities of the national defense program. Already many experiments have been performed with such materials as rubber, synthetic rubber, various kinds of plastics (such as cellulose acetates, resinous compounds, and phenolic condensation products), asphaltic materials, linoleum, cellulose products, paints, and enamels. Many of the more recent formulas of plastic articles have been developed in this laboratory.

The laboratory is equipped with production-size machines as well as experimental machines so that when formulas are developed and tested on a laboratory scale, tests can be completed at once in the same size of machines that will be used for production.

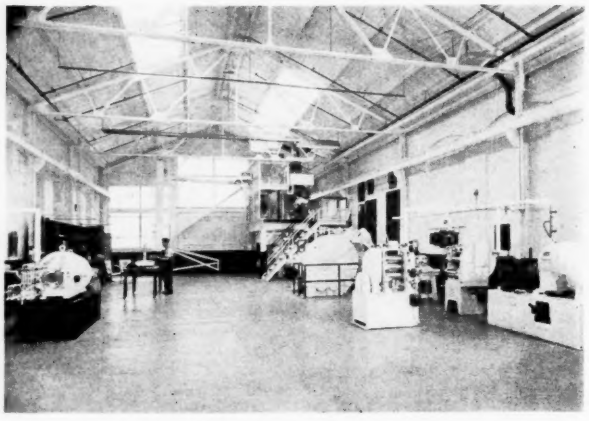
Procedure

Where customers are well informed of their own requirements and need only the machinery and equipment, formulas are compounded according to the customers' selection, and they are allowed to have full control of the technique. In other cases, where the procedure is new, Farrel-Birmingham Co. can, if desired, furnish practical assistance in the development of processing technique.

The laboratory is operated in such a way that the user has complete privacy and secret processes or formulas need not be disclosed to anyone. Schedules are so arranged that no two clients are there at the same time. The laboratory is under the supervision of an engineer who has had many years' experience in the rubber and plastics industries, and the operation of the equipment is performed only by trained and experienced personnel.

Equipment

The main room of the laboratory is 36 feet wide by 90 feet long and is thoroughly modern in equipment and layout. With the exception of the lower part of the walls



General View of Testing Laboratory at Farrel-Birmingham's Derby, Conn., Plant

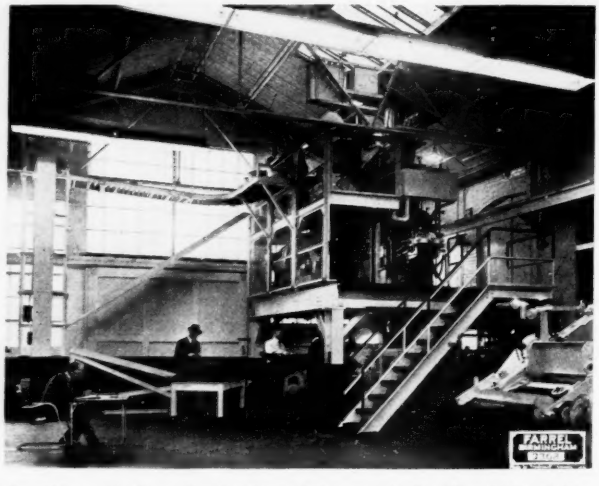
and floor the entire interior and the machinery are painted white, providing bright lighting under most daytime conditions. Fluorescent lamps also provide bright illumination during the hours when artificial light is necessary.

The machinery includes a size 3-A Banbury with two-speed drive so that it can be operated at speeds of 34 and 68 r.p.m. The Banbury is mounted over a 22- by 48-inch heavy-duty, two-roll mill, which can be used for sheeting out the stock from the mixer or for other milling operations. An elevator and conveyers carry materials from the main floor to the operating platform of the Banbury mixer. Next to this Banbury mixer and sheeting mill installation is a tilted refiner with 21- by 24- by 36-inch rolls. This machine is driven by individual motor and arranged to operate at either 20 or 61.44 r.p.m.

The experimental-size equipment consists of two laboratory Banburys—a size "B" and a midget; a 6- by 13-inch two-roll mill; a 6- by 13-inch three-roll calender; a three-inch plasticator and an 8- by 8-inch hand-operated hydraulic press, with electrically heated plates.

A 15-hp. automatic, gas-fired boiler provides steam

(*Continued on page* 424)

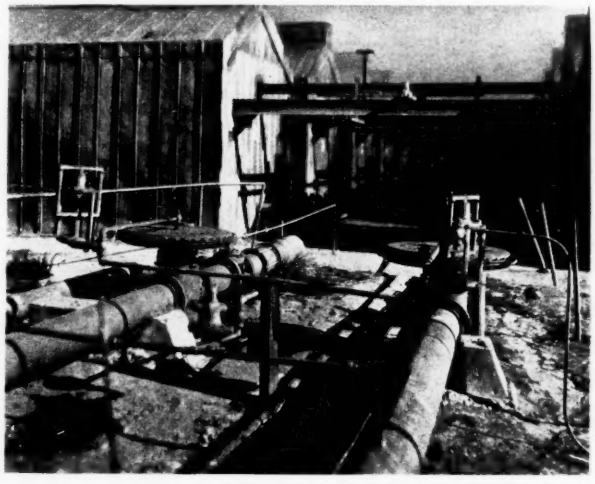


Running a Test on the Banbury Mixer and Sheeting Mill at the Laboratory of Farrel-Birmingham Co.

Isothermal Control of Channel Carbon Black Production

C. R. Johnson[1]

CARBON black manufacturers have learned by experience and plant tests that variations in weather conditions result in more variations in quantity and quality of carbon black by the channel process than by any other factor. This is true because weather is uncontrollable and other factors affecting the quantity and quality are, in a large measure, controllable. To meet variability in production conditions caused by variations in weather, Continental Carbon Co. has installed and operated for over a year a device[2] to control combustion conditions to compensate for variations in weather.



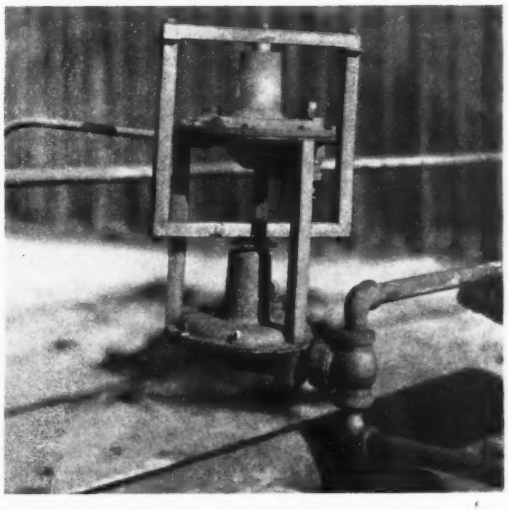
This General View Shows the Layout of Gas Regulators and Large Main Valves

In the conventional method of manufacture of carbon black by the channel process it is usual to employ many thousands of lava tipped gas flames so placed with reference to the steel channels upon which the carbon is deposited that the flame actually impinges and spreads over the bottom surface of the channel. For example, a single unit of the Continental plant is composed of a group of 42 buildings, 10 feet wide, 180 feet long, containing 10 rows of channels running the entire length of the building. Beneath this channel system are located 2,880 burner tips in each building.

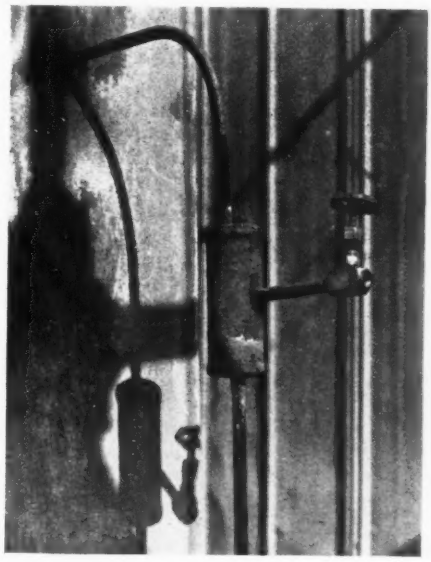
The channel system is mounted on a track which permits slow reciprocating motion of the channels longitudinally through the building at an extremely slow rate, approximately 15 minutes for a motion of eight feet. Beneath this, the system of burner tips is so laid out with its supply pipes that the distance of the tips from the bottom of the channel can be accurately established and maintained so that the flame of each tip impinges on the channel to the same degree.

The flame is of the luminous type and fishtail in shape, placed with the flat sides at right angles to the longitudinal edges of the channels.

The accepted theory on the composition of the flame of this character is an outer sheath of burning gas, more or less invisible because of the complete combustion. This outer sheath serves to heat the inside layer of gas to the point where a combination of cracking and partial combustion occurs which causes the formation of luminous particles of carbon. The function of the channel is to interrupt this reaction and trap out the incandescent particles of carbon on the relatively cooler surface of the



The Upper Part of the Control Element Receives the Pressure of the Heat-Sensitive Element in the Hot House and Varies the Pressure in the Lower Part, a Pilot Valve That Controls the Main Line Valve to Vary the Gas Flow



In this Oil-Containing Cylinder the Air Pressure from the Heat-Sensitive Element inside the Hot House Forces the Oil along the Lower Pipe to the Control Element

[1] Technical director, Continental Carbon Co., 295 Madison Ave., New York, N. Y.

[2] Patent applied for.

channel. Between each series of 16 tips along the channel is placed a scraper bar, below which is a hopper chute which receives the soot as it is scraped off by the action of the moving channel over the scraper bar. Thus on each cycle of travel the black is completely scraped from the channel, and a fresh surface exposed.

The quality of the black is controlled by a number of factors, including design of lava tip, rate of gas flow, distance of tip from the channel, and the amount of air supplied to the building for combustion purposes.

It is in connection with the combustion control that this device is used. The amount of air available for combustion is supplied by means of natural draft openings in the top of the building providing exit for the combustion gases and smoke, and openings around the bottom of the building permitting entrance of combustion air. The usual manner of operating these is to regulate by hand the amount of bottom opening so that the flame has the appearance of being slightly starved for air. As a result of this method of operation, the top portion of the building above the flames contains a blanket of smoke which hangs down and partially obscures the flame as observed through peep holes. If insufficient air is supplied, the smoke blanket will drop so low that the flames will smother out; on the other hand, if too much air is supplied, the blanket lifts, and the flames burn bright, but do not produce so much carbon, nor is the quality equal to that obtained by a properly balanced and slightly smothered combustion.

The above operation, depending as it does upon natural draft, is extremely susceptible to changes in this draft. For example, a heavy rain will so cool the inside of the building that the draft rate is cut down, and the flame reaction is lightly altered so that quality and quantity of soot is changed. On the other hand a high wind with its aspirating effect on the top openings will increase the draft and again alter conditions within each individual flame. With the hundreds of buildings in a modern carbon black plant it is not practical to readjust the draft with every change in weather condition. Wind velocities are generally heavier in the day time than at night, and the temperature drops considerably at night compared with the day temperature. The isothermal control is provided to compensate for all of these variations in conditions by maintaining more nearly constant draft conditions by increasing the amount of gas flow when external conditions produce a lowering of the temperature within the house, and conversely, decreasing the amount of gas burned whenever external conditions raise the temperature within the house.

The isothermal control system is composed of a long gas-filled sensitive member placed in the middle of two buildings of each unit about 14 inches above the top of the channel. This member is connected by a closed system to an outside diaphragm which in turn operates a liquid-filled system tied directly with the master gas regulator for the entire unit. Thus a fall in temperature in the burner house actuates the gas-filled and liquid-filled controls so that the master regulator admits more gas to the entire unit. Conversely, whenever the temperature within the burner building rises above the desired point, the control system cuts down the amount of gas fed to the unit and again establishes normal combustion conditions. The operation of the device may be illustrated by night and day changes in gas rate as observed on the unit gas meters. Temperatures in the Texas Panhandle may vary as much as 50 to 60° between day and night, and the isothermal control compensates perfectly for this.

Under the old system of operation the flow of gas to the burner system is set at one point, which cannot be right for both day and night operation. The same considerations apply to temperature changes caused by high winds and heavy rainstorms.

Data which have been collected over considerable length of time, with and without the control, quite definitely prove that the application of this control not only results in an increase in production, but a very definite improvement in the uniformity of the product from a quality standpoint. This has been proved by tests of the material in rubber compounds and also by D.P.G. adsorption tests which record variation in the quality of the product.

In order to determine the effectiveness of this control in leveling out variations in quality of carbon black produced under the varying weather conditions, one unit in the Continental plant was operated for 30 days with the control and 30 days without the control. During this time frequent samples of the product were taken each day and tested with the D.P.G. adsorption tests. Analysis of these data gave the following statistical results, indicating a definite superiority in control by the utilization of the isothermal system:

	With Control	Without Control
Average D.P.G. Adsorption	48.54	48.35
Maximum + Deviation	2.83	4.85
Maximum — Deviation	3.79	7.25
Average Deviation	1.04	2.23

Isothermal control of production is the invention of L. M. Conner, gas engineer of Continental Carbon Co., developed in collaboration with engineering associates at the Continental plant.

Dr. Kolachov on *Kok-Sagyz*

In a paper[1] entitled, "American Rubber from American Farms", Dr. Paul J. Kolachov urges experimentation with two rubber-bearing plants, the *Kok-sagyz*, of Russian origin, and the guayule, of Mexico, both of which have possibilities of cultivation in this country. Excerpts from this paper, which relate to the *Kok-sagyz*, follow.

The *Kok-sagyz* is a highly adaptable plant, inasmuch as it is readily acclimatized and can be cultivated in a wide variety of soils. Discovered in Russia in 1931, *Kok-sagyz* belongs to the dandelion family, *Compositae*, is perennial, and reproduces by seeds. The important part of the plant for rubber production is the rhizome (root). *Kok-sagyz* develops a maximum yield of rubber on highly structural black soil, rich in organic material, especially nitrogen and super-phosphates. It requires over 20 inches rainfall a year. If the crop is harvested at the end of the first year, *Kok-sagyz* plants yield an average of 4,500 to 5,500 pounds of cleaned roots per acre, which in turn yield 150 to 200 pounds of crude rubber and 75 to 100 pounds of seed. If the crop is left for a second year, the average yield is 2,700 to 3,600 pounds of root and from 100 to 150 pounds of seed. At the end of the second year the percentage of crude rubber is higher, but the yield of the roots is less since the plants have been thinned out by the frosts of the preceding winter, have been attacked by rodents, and have been spoiled by their tendency to work up through crevices in the soil. Russia now has under cultivation 175,000 acres of *Kok-sagyz*, and it had been planned to increase this to 2,500,000 acres.

[1] Copies may be obtained upon request from the National Farm Chemurgic Council, 50 West Broad Tower, Columbus, O., for which the paper was prepared.

The Conservation of Rubber Latex[1]

R. O. Babbit[2]

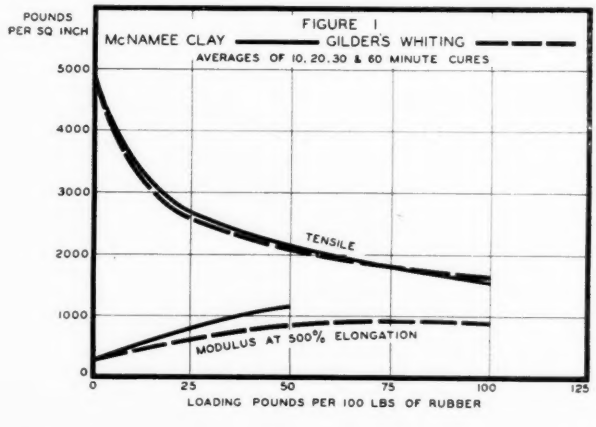
THE problem of conserving natural latex rubber is important at this time when rubber is especially costly and restricted. Proper compounding and the addition of materials that will extend the rubber without unduly affecting its quality and utility must be resorted to. This paper will deal with methods of conserving latex, including a review of some of the extenders that can be used in latex. Graphs of work done in the Vanderbilt laboratories will show the effect of certain of these extenders on the physical properties of the latex film.

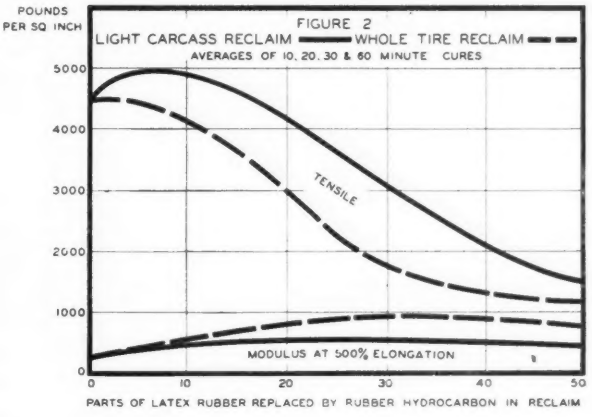
General Problem of Conservation

The first step in conserving latex rubber should be the proper use of compounding materials to produce a final product which will have a satisfactory storage and service life. It is more important now than ever that the rubber or combination of rubber and extenders be vulcanized with accelerators, activators, and vulcanizing agents that give the best quality. Also the rubber should be protected with the best antioxidant or combination of antioxidants that will resist deterioration under the conditions to which the rubber article is subjected. It is obvious that if all manufacturers of rubber articles would make the best possible quality products, rubber would be saved as replacements would be reduced.

In this paper the word extender will be used as a broad term to cover any material that is added to latex as a diluent. Extenders that are added to latex, of course, do not reenforce the dry films; therefore they produce a greater falling off of tensile than in a corresponding milled dry rubber film. Where high tensile is important, a limited amount of extender should be used, and the extender should be one that will change the physical properties least. However other properties, a few of which are modulus, elasticity, "feel" or "hand", coefficient of friction, and adhesive value, are more important than tensile when dealing with latex films that are used in conjunction with or upon other materials. Coating and sizing compounds are examples. Although the description and graphs given herein emphasize only tensile and modulus, it is hoped that they will aid the latex compounder in selecting the proper extender and the amount of extender for his particular purpose.

[1] Paper which received honorable mention in the 1941 Essay Contest sponsored by the New York Group, Rubber Division, A. C. S.
[2] With R. T. Vanderbilt Co., Inc., 230 Park Ave., New York, N. Y.
[3] *Vanderbilt News*, 7, 6, 36-37 (1937).
[4] Royce J. Noble, "Latex in Industry," p. 71. *Rubber Age*, New York, 1936.





Mineral Fillers

Mineral fillers, such as clay and whiting, are commonly used for reducing the rubber content of a latex compound. These types of fillers are probably the most economical and have been most widely used in latex.

The graph[3] in Figure 1 shows the effect on the physical properties of different loadings of McNamee clay and whiting. The clay and the whiting were dispersed in water by stirring and using 2% of Darvan No. 1 on the dry filler. They were added to the latex as dispersions of 50 and 60% concentration respectively. The latex compound used as a base is as follows:

TABLE 1

Rubber from 60% Latex	100
Zinc Oxide	2
Sulphur	0.6
Agerite White	1
Butyl Zimate	1
Latex Telloy	0.5

Cures were made in hot air at 93° C. (200° F.)

It will be noted that while the tensile curves of Gilder's whiting and McNamee clay are similar, the clay produces a higher modulus. Loadings of 10% of these fillers on the rubber do not seriously impair the physical properties of the latex films. High loadings, such as equal parts of rubber and filler, produce films that because of their low tensile and high modulus may be unsuitable for some purposes, but entirely satisfactory for others.

Reclaim and Synthetic Dispersions

Artificial latices[4] include aqueous dispersions of both rubber and reclaim and aqueous dispersions of synthetic rubber such as neoprene and butadiene derivatives.

Dispersions of reclaim in water are finding increased use as extenders for latex; while dispersions of crude rubber, owing to cost, find uses only in a few specialized

fields. Reclaim dispersions may be substituted for a small portion of latex where high tensile is important, and in applications where tensile is not particularly important it may replace increasing amounts up to all of the latex.

Figure 2 shows the effect on the physical properties of replacing part of the rubber in latex with rubber hydrocarbon from dispersed reclaim. The solids of the carcass reclaim contained approximately 60% rubber, and the whole-tire reclaim approximately 55%. The latex compound used as a base with the dispersed reclaim is as follows:

TABLE 2

Rubber from 60% latex or rubber hydrocarbon from dispersed reclaim	100
Zinc Oxide	3
Sulphur	1
Agerite White	1
Butyl Zimate	1

Cures were made in hot air at 93° C. (200° F.)

The tensile curves show that substitution of dispersed reclaim for small proportions of the latex rubber actually speeds the cure in the case of the carcass reclaim and does not produce rapid falling off of tensile when small quantities of whole tire reclaim are used. Neither does the modulus rise so rapidly as when clay or whiting is used. While more expensive, dispersed reclaim does offer an advantage over mineral fillers in that films from a mixture of latex and a high proportion of dispersed reclaim retain more of the elasticity characteristic of rubber.

Neoprene latex has been used more than that of other synthetic rubbers as it has been available to the trade for a longer time. In the past it has been used mainly for its oil-resistant properties. However if and when sufficient production is obtained, it could be used at least in part in many applications where natural latex is used at present. Neoprene latex may be compounded with the same fillers and pigments as natural latex, but in general more care must be taken to see that the neoprene latex mix is properly stabilized. Physical properties can be obtained which are nearly equal to those of natural latex. Present-day neoprene latices may be mixed with latex in any proportion. A vulcanizable neoprene latex compound is shown in Table 3.

TABLE 3

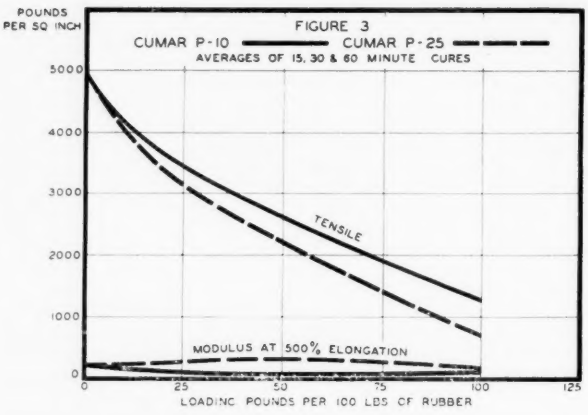
Neoprene (from Neoprene Latex Type 57)	100
Zinc Oxide	5
Lithopone	25
Sulphur	2
Agerite White	1
Butyl Zimate	1

A film from this formulation will give a tensile of 3,500 to 4,000 pounds when cured for one hour to two hours at 250° F. Latices of other synthetic rubbers may be used in place of or in combination with natural latex if they become available in commercial quantities.

Other Extenders

Paracoumarone-indene resin may be emulsified and mixed with rubber latex. Figure 3 shows the effect on the physical properties of adding Cumar P-10 and Cumar P-25 to latex. The same acceleration and curing conditions were used as have been shown in Table 2.

The addition of paracoumarone-indene resin in this compound did not produce so rapid falling off of tensile as did a mineral filler. Films made from equal parts of resin and rubber have good elasticity and flexibility. The fact that the modulus is reduced by increasing amounts of resin enables this material to be used in conjunction with clay, whiting, or other materials which have the tendency to increase the modulus and provide a stiff feel. Other resins may be used with latex to give films of



varying properties.

Starch pastes and asphalt emulsions are used with latex in fairly large amounts with or without other extenders for coating and backing compounds where tensile is not important. Starch pastes are made by gelatinizing starch in hot water and are usually about 10% concentration. The fact that loading with starch stiffens a latex film considerably, limits its use to coatings and sizings where thin films are used. Asphalt emulsions are available which are designed for use with latex. The emulsified asphalt can be used both as an extender and a softener. Oil emulsions may also be used with many of the extenders to reduce the modulus.

Latex rubber can be further conserved by compounding to make the rubber last as long as possible and by a still further consideration of extenders available. A study of these extenders may result in the use of one or a combination of materials to replace part of the latex rubber without impairing the utility of the rubber product or application.

Rubber Needs for War

In order to appreciate better the government's problem in its restriction of crude rubber, according to the New York *Journal of Commerce*, the OPM has prepared a list of military requirements which need rubber. The following products, together with their rubber requirements were cited:

Bullet-proof gasoline tank on flying fortress, 1,246 pounds of rubber; bullet-proof gasoline tank on P-40 pursuit plane, 90 pounds; pneumatic raft carried by airplanes for emergency landings, 29 pounds; tires for airplanes, 35 to 96 pounds, each; inner tubes for airplane tires, 24 to 55½ pounds, each; a 75-millimeter gun carriage, 175.3 pounds; 37-millimeter anti-aircraft gun carriage, 190 pounds; troop carrier, 332 pounds; scout car, 339 pounds; cable assembly used by the signal corps, 150 pounds; army raincoat, 2.14 pounds; gas mask, 1.81 pounds; roll of adhesive plaster used by the medical corps, 0.02-pounds; ten-ton pontoon bridge, 3,200 pounds; 28-ton tank (medium), 1,750 pounds.

In addition, a 2½-ton truck, that has eight wheels and usually carries four extra tires as spares, requires approximately 525 pounds of rubber. A half-ton truck has need of 125 pounds of rubber, chiefly for tires. A 35,000-ton battleship calls for 150,000 pounds of rubber. This amount of rubber would be enough to make over 13,000 tires of the 6.00 by 16 four-ply type.

Reclaim Is Ready

William F. Tuley[1]

DURING the weeks that have passed since the incident at Pearl Harbor the importance of rubber to our national economy has been made clearer than ever before. The critical situation in the Pacific has made necessary a strict limitation on our stock pile of crude rubber and has spotlighted the need of other sources of supply.

To meet the demands of industry our "domestic rubber plantations", the nation's reclaim plants, have responded with plans for immediately increased capacity.

Reclaimed rubber undoubtedly will maintain a tremendously important position through the war emergency. The production of synthetic rubber or of natural rubber from domestic vegetable sources will not equal reclaimed rubber in volume until expanded beyond the 1941 program.

The rubber industry has been operating since July 1, 1941, under an increasing restriction on the consumption of crude rubber, and now, of course, the situation is even more critical. The rubber consumption by months in 1941 shows a high rate in the early part of the year, reaching a peak in June just before restriction was applied, followed by a drop to a more normal level. This trend is illustrated in Figure 1.

The demand for rubber goods for military equipment, for industry, and for civilian use, has continued, and the rubber industry has endeavored to meet this demand to the best of its ability. The use of reclaimed rubber to supplement the supply of natural rubber and to aid in conserving rubber has received wide approval.

In this situation the use of reclaimed rubber has steadily increased both in total volume and in ratio to the quantity of crude rubber. This is illustrated in Figure 2 and Figure 3 which are based on the official reports of The Rubber Manufacturers Association, Inc., and the Rubber Reclaimers Association with the latest revisions of the United States Department of Commerce. These results on reclaim are particularly interesting when considered in relation to the crude rubber consumption by months during 1940-41, illustrated in Figure 3.

The most outstanding fact about the reclaim picture is the sharp increase in the ratio of reclaim to crude rubber in recent months. It is indicated that in October, 1941, the rubber industry consumed about 4.5 pounds of reclaimed rubber for every ten pounds of new rubber. This

On the Roof of Naugatuck's Reclaim Plant

EDITOR'S NOTE: All photographs of the reclaiming process were taken at the Naugatuck reclaim plant at Naugatuck, Conn.

[1] Sales manager, Rubber Chemicals & Reclaim, Naugatuck Chemical Division of United States Rubber Co., 1230 Sixth Ave., New York, N. Y.

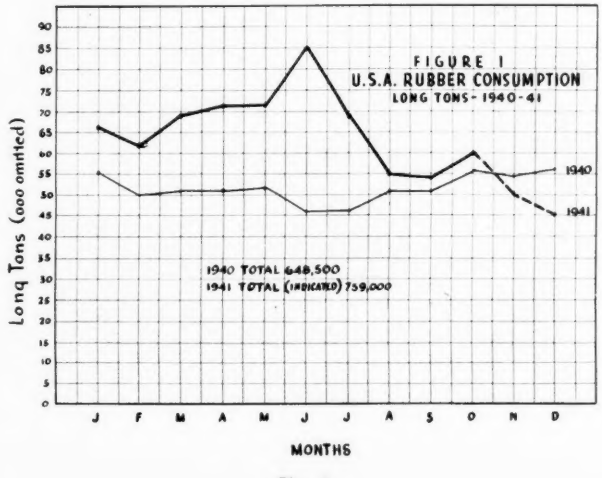


Fig. 1

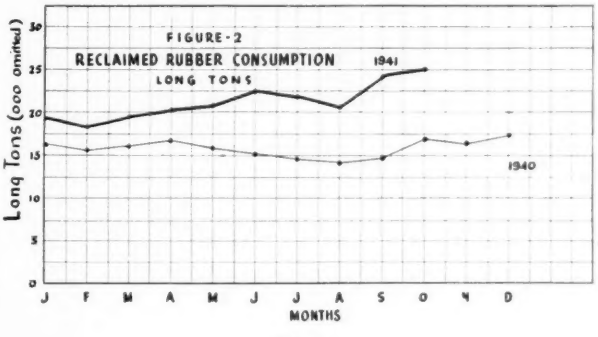


Fig. 2

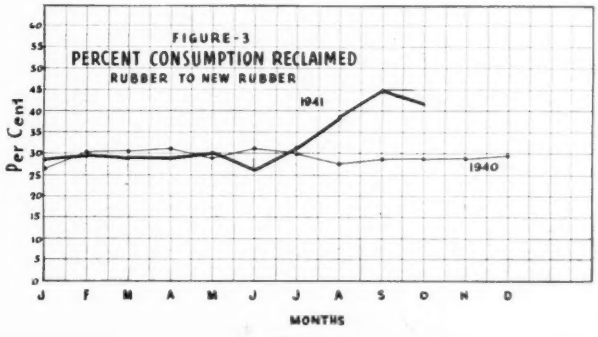
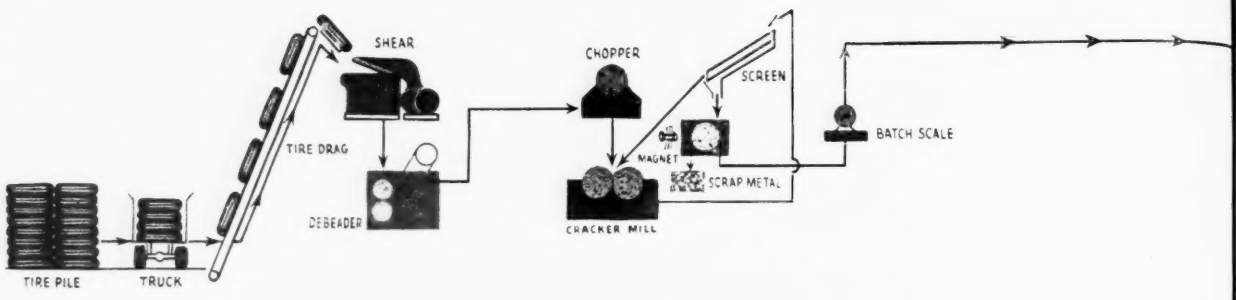


Fig. 3



Flow Chart Showing Steps in Naugatuck's Reclaiming Process

may be compared with a ratio of about 57% as much reclaimed as new rubber consumed in 1917 when imports of crude rubber were restricted during the first World War. The high consumption of reclaim in 1928 (51.1% on the crude rubber consumed) resulted from several years of high priced rubber which at one time (1925) went to $1.23 per pound.

It is impossible to forecast the extent to which the use of reclaimed rubber may supplement crude rubber consumption. This will be determined by many factors, principally by the amount of crude rubber allotted for the manufacture of products needed in the expanding war production and for civilian use.

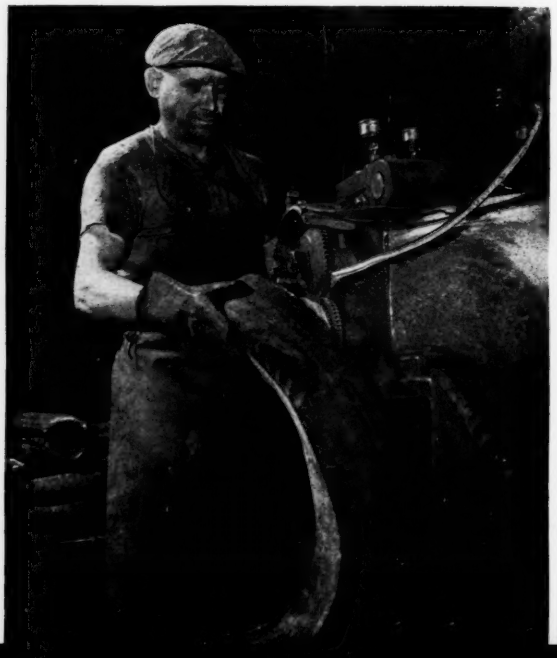
Undoubtedly the use of reclaimed rubber can be extended further now than ever before. This is possible because reclaim is produced in grades suitable for wider uses than heretofore. Quality and uniformity are under more strict control. Reclaims are now made to meet standard specifications agreed upon by the reclaimer and the consumer. Processing qualities have, in particular, been improved so that the proportion of reclaimed used may be increased without causing difficulties in the manufacture of rubber goods.

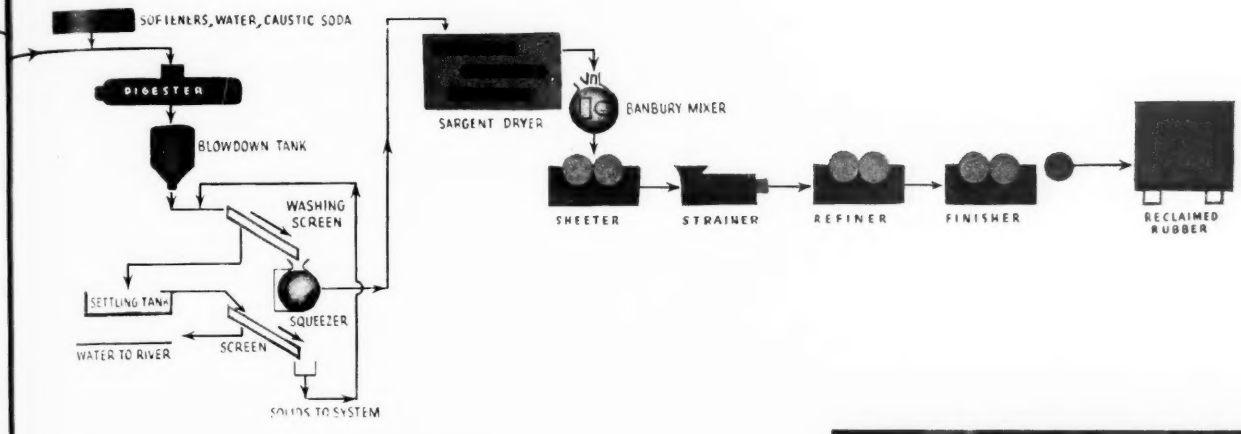
The quality of reclaimed rubber as produced today is believed to be superior to the reclaim of several years past because of the character of the rubber scrap now available. This scrap is now based on modern compounding with superior organic accelerators and lower sulphur ratios

Stock Pile of Worn Tires

Tires Are Pulled over to the Shearing Blade and after Cutting Are Pushed on to the Conveyer Belt for Delivery to Debeaders

The Bead of the Tire, Removed by Inserting the Cut End of the Tire between Rotating Knives, Falls into the Pan at the Extreme Right. The Debeaded Tire Is Pushed on to the Belt Conveyer in Front of the Operator





The Operator Is Removing the Accumulated Metal from the Magnetic Separator Which Removes Most of the Metal from the Ground Tires

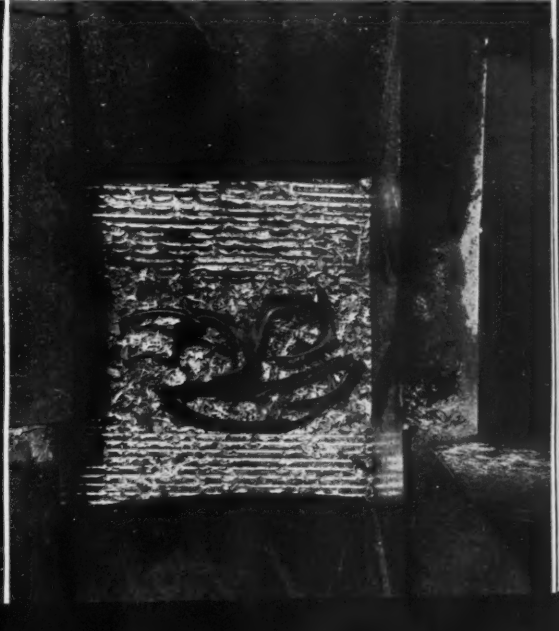
and is protected by antioxidants. The better quality of rubber products resulting from this compounding must carry through into the reclaimed product.

Furthermore our present powerful accelerators are capable of developing to a greater extent high strength, abrasion resistance, and durability in compounds containing high proportions of reclaimed rubber. The availability of a variety of accelerators with different characteristics enables chemists to control some effects of higher ratios of reclaim.

For government use in the emergency it is possible reclaim can supply the answer to the vastly increased demands.

Some new uses for reclaimed rubber have now become important. One of these is an extensive use as aqueous dispersions. These dispersions are synthetic counterparts of latex except that the dispersed phase may be derived from either reclaimed rubber or crude rubber. The pres-

This Chopper, One of the Largest of Its Kind, Is Wide Enough to Take Any Passenger-Size Tire. The Tires Are Fed into the Machine by the Toothed Feeder Roll in the Center. The Mechanic Is Adjusting the Knives Which Revolve on the Drum at High Speed



This Picture, Taken from Above, Looking Directly down into the Bite of the Rolls of the Cracker, Shows the Larger Pieces of Stock from the Chopper together with the Smaller Pieces Returned from the Screening Operation

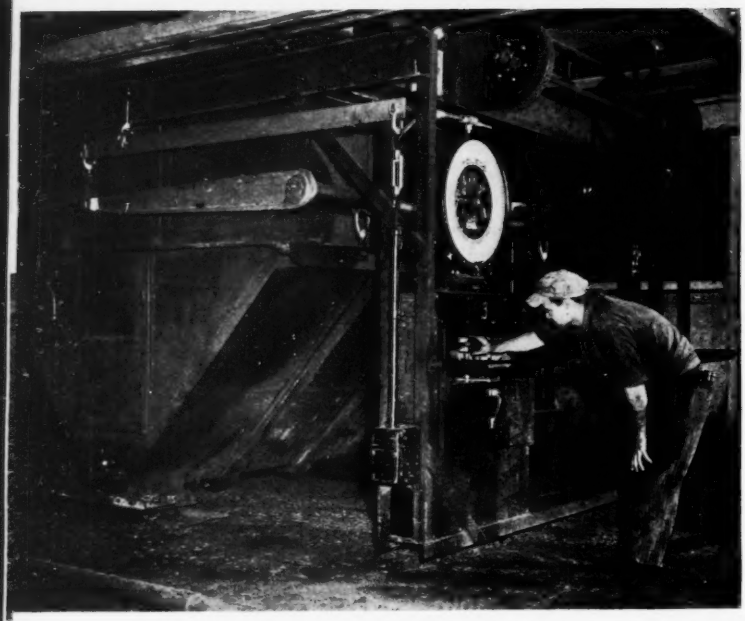
Collectors for the Two Types of Conveyers Used in Delivering Cracked Stock Are on the Factory Roof. At the Left is the Blower-System Collector into Which the Stock is Blown and from Which It Drops by Gravity into the Pipes Below, While the Air Escapes through the Open Top of the Collector. At the Right Is the Vacuum-System Collector

ent commercial applications, which are quite similar to those of latex, nearly all make use of dispersed reclaim. These dispersions are available in various colors and compositions, varying in concentration, stability and other characteristics. The many uses for reclaimed rubber dispersions now account for a substantial consumption of reclaim.

Examination of the many steps involved in the production of reclaimed rubber from various types of scrap rubber shows many possibilities for varying the quality and properties. The important operations in producing "alkali process" whole-tire reclaim, the most widely used type, are shown in the accompanying flow sheet.

The first step toward reclaim production operating comes in selection of the scrap which may be bus and truck tires; passenger tires; tread or carcass sections of tires; inner tubes, red, black or mixed; or a wide variety of other rubber products. Each of these requires a different treatment. Rubber scrap containing cotton fiber is treated with dilute caustic soda at high temperatures and pressures (200 pounds or more) to destroy the fiber. This treatment has an important effect on the quality of the finished reclaim. Another one of the most important steps is the final "refining" operation in which the reclaim is passed through tight roll mills to remove all hard unplasticized particles. This determines the cleanliness of the finished reclaim.

The manufacture of reclaimed rubber requires many raw materials in addition to its principal one of scrap rubber. These are mostly of a chemical nature. Caustic soda is used to destroy fiber, remove free sulphur, and plasticize rubber. There is no efficient substitute for caustic soda for this purpose. Caustic soda is produced



Cracked Stock Is Delivered by Gravity into This Digester Scale from Bins Overhead, and the Weighed Stock Dropped into the Digesters through Openings in the Floor. The Scale, Motor-Driven through Rubber-Tired Wheels, Moves on Overhead Tracks to Allow for Delivery from Any Bin on the Line to the Corresponding Digester Below. Stock Is Moved to the Floor Opening at the Left by Means of a Horizontal Screw Conveyer. The Pipe *(Lower Left)* Is the Delivery Pipe for Caustic Solutions and Oils Which, with Cracked Stock, Make Up the Digester Load

(Lower Left Photo)

Underside View of Digesters Shows Covered Steam Pipes Leading to the Jacket and Uncovered Blow-Down Pipes Leading to Storage Tanks. The Operator *(Lower Right)* Is Operating the Chain-Driven Blow-Down Valve by Which the Finished Stock Is Released

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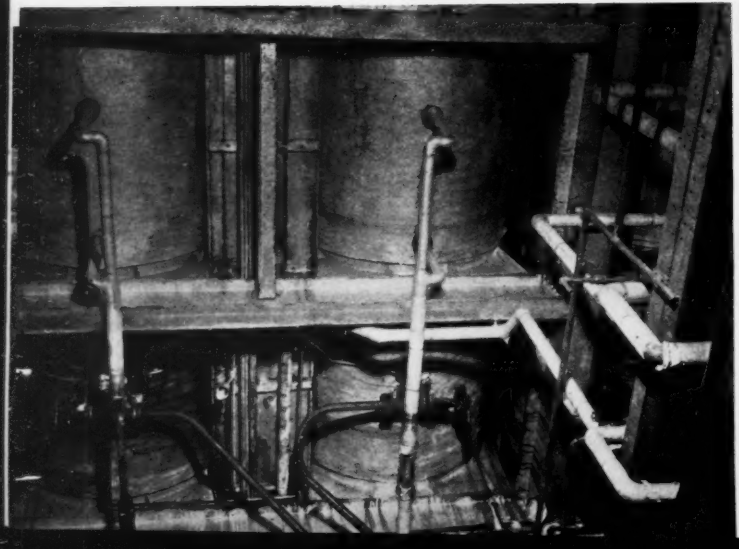
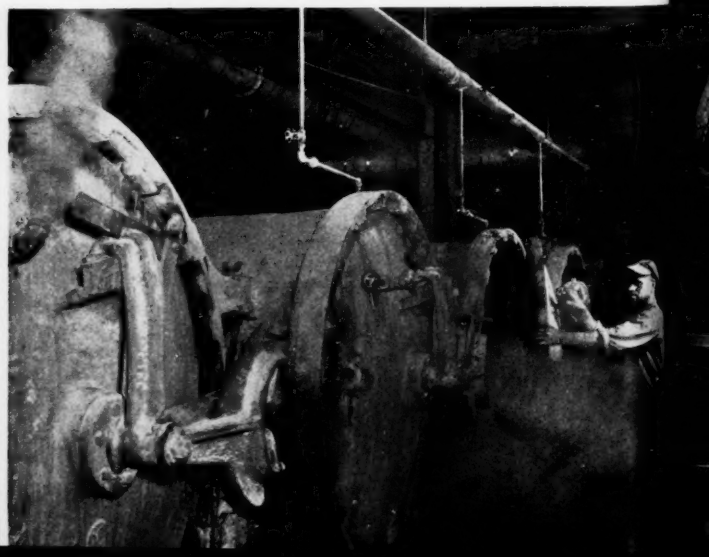
These Devulcanizers Are Used in the Next Step of the Reclaiming Process





After the Stock Is Taken to the Shipping Room, a Careful Inspection Is Made by Experienced Operators, and Any Slabs not up to Standard Are Marked for Return to Process. The Stock Is Sampled and Tested before Storing and again before Shipment if the Storage Period Exceeds Certain Limits

in tremendous quantity and is ordinarily in abundant supply as a by-product of chlorine. It is important that in the present shortage of many chemicals there shall continue to be an adequate supply of chemicals for reclaiming rubber. This includes a variety of oils and plasticizers, some of coal-tar origin, and some, such as pine tar, from other sources. These materials are also essential for reclaiming.

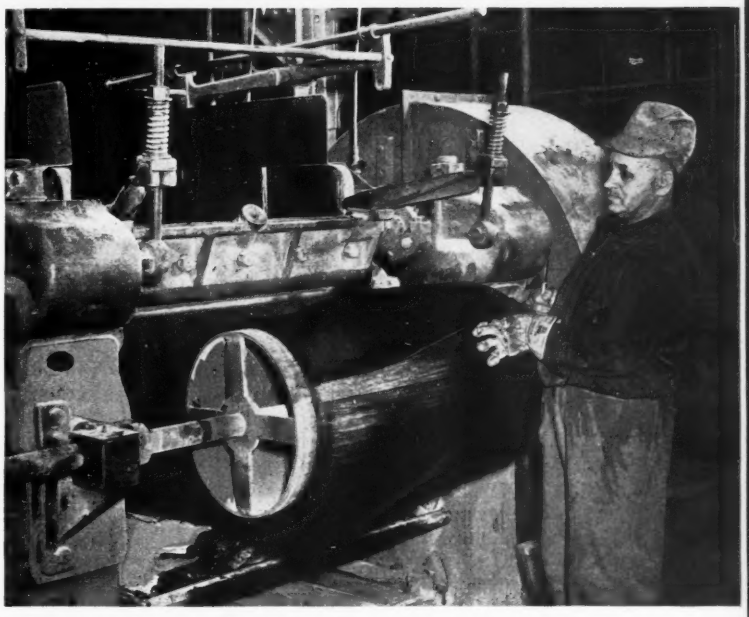
In the face of a rapid increase in the consumption of reclaim, the producers have steadily increased production. The stock of reclaim on hand had increased in September, 1941, by 32% from September, 1940. The stocks on hand last September constituted about a seven weeks' supply. The present stocks are probably still higher and are increasing.

The production capacity of the reclaim industry has also been substantially increased. This has been accomplished by increased efficiency in production with high operating rates and by installing such new equipment as was needed to eliminate "bottle-necks" and balance production through the plants.

The fact is that recent operations have given almost all producers an opportunity to test their plants for maximum capacities which previously had been only estimates. Most of them have done better than the previously forecast limit.

John P. Coe, 1941 president of the Rubber Reclaimers Association, in discussing the status of reclaimed rubber in September before the Atlantic City meeting of the Division of Rubber Chemistry of the American Chemical Society estimated the seven-day operating capacity of the industry at 300,000 long tons annually. Recent reports indicate that it now may be considerably above this figure.

The reclaimed rubber industry has shown that it is capable of adjusting itself to the demands of a period of abnormally high consumption of its product. Its production is materially aiding the rubber conservation program. The record of the present year indicates that the present production capacity, if maintained at a high efficiency and supplied with necessary materials, will meet any demands likely to be made upon it.



The Operator Is Performing the Final Operation: Cutting from the Drum of the Refining Mill a Slab of Finished Stock for Delivery to the Shipping Room

The Conveyer in the Center Delivers Digested, Washed Stock to the Feed Hopper of the Continuous Drier. Above the Conveyer Are the Flights Which Deliver the Stock to the Drier

Stock Is Fed into the Mouth of the Strainer, and the Stock Screw Forces It through a Screen and Out through the Strainer Head Where the Knife Cuts It off in Lengths of One Inch to Two Inches. The Stock Drops into a Hopper and Is Conveyed to the Refiners

Supplementary Order No. M-15-B To Restrict the Use of Rubber

WHEREAS, the further importation of crude rubber is imperiled:

NOW, THEREFORE, it is hereby ordered that: 940.3 GENERAL LIMITATION ORDER

(a) Definitions. For the purposes of this order:

(1) "Rubber" means compounded liquid latex, and all forms and types of crude rubber and liquid latex in crude form, but does not include, balata, gutta percha, gutta siak, gutta jelutong, pontianac, reclaimed rubber and scrap rubber.

(2) "Processor" means and includes any person processing or consuming rubber.

(3) "Person" means any individual, partnership, corporation, or other form of business enterprise.

(b) General restriction on the use of Rubber. From the date of issuance of this Order until otherwise ordered by the Office of Production Management no Processor shall consume, use or process any Rubber, except for any of the following purposes:

(1) To fill orders assigned an A-3 or better Preference Rating.

(2) To manufacture camelback in amounts not exceeding the minimum amounts specified in letter dated December 5, 1941, from the Director of Priorities to manufacturers of camelback.

(3) To manufacture tire casings and tubes and other rubber products necessary for the manufacture, maintenance or repair of trucks or buses which require tires having a diameter of seven inches or more.

(4) To manufacture mechanical goods, hard rubber products and sponge rubber products for industrial equipment, maintenance, and repair.

(5) To manufacture medical, surgical, and druggists' supplies.

(6) To manufacture cements for the shoe trade, and heels made of black or brown composition rubber only, and soles, taps and soling strips made of black composition rubber only.

(7) To fill orders for industrial rubber gloves, fabric topped footwear made with black compounded rubber soles only, rubber boots and protective rubber clothing, galoshes with fabric tops and plain all rubber overshoes and galoshes.

(8) To manufacture plumbers' supplies.

(9) To manufacture articles for use in the canning and food packing industries.

(10) To manufacture compounds for insulating wire and cable.

Provided that the use of Rubber by each such person during any calendar month beginning with the month of December, 1941, in the manufacture or processing permitted by sub-paragraphs (3) to (10), inclusive, shall not be at rates greater than the rates of consumption in the manufacture of similar items during November, 1941, to fill purchase orders which were not assigned a Preference Rating of A-3 or better.

(c) General restriction on sales and shipments. Except to fill purchase orders assigned an A-3 or better Preference Rating from the date of issuance of this order until Monday, December 22, 1941, no new automobile, truck, bus or motorcycle, farm implement or other type of casing or tube shall be sold, leased, traded, delivered, or transferred, provided that the foregoing prohibition shall not apply to tires which are sold as a part of new or used vehicles being sold, and which are affixed to such vehicles at the time of their sale. And also, no person shall ship or permit to be removed from his plants, warehouses or other places of storage during any calendar month beginning with the month of December, 1941, quantities of any class, or type of rubber goods other than tires at a rate in excess of the rates of shipment, or removal of similar classes or types of rubber goods during the month of November, 1941, to fill purchase orders not assigned a Preference Rating of A-10 or better, except for the purposes of filling purchase orders assigned a preference rating of A-10 or better.

(d) Violations. Any person who violates this Order may be deprived of priorities assistance or may be prohibited by the Office of Production Management from obtaining any further deliveries of materials subject to allocation. The Office of Production Management may also take any other action deemed appropriate, including the making of a recommendation for prosecution under Section 35A of the Criminal Code (18 U.S.C. 80).

(e) Appeal. Any person affected by this Order who considers that compliance therewith would work an exceptional and unreasonable hardship upon him, may appeal to the Office of Production Management by addressing a letter to the Rubber and Rubber Products Branch of the Division of Civilian Supply, Office of Production Management, Washington, D. C., setting forth the pertinent facts and the reasons such person considers that he is entitled to relief. The Office of Production Management may thereupon take such action as it deems appropriate.

(f) This Order supersedes the provision of paragraph (c) (1) of General Preference Order M-15, as amended and supplemented, and all letters issued pursuant to such paragraph (c) (1).

(g) Effective Date. This Order shall take effect upon the date of its issuance.

(P. D. Reg. 1, Aug. 27, 1941, 6 F. R. 4489; OPM Reg. 3 amended, Sept. 2, 1941, 6 F. R. 4865; E. O. 8629, Jan. 7, 1941, 6 F. R. 191; E. O. 8875, Aug. 28, 1941, 6 F. R. 4483; sec. 2(a), Public No. 671, 76th Congress, Third Session, as amended by Public No. 89, 77th Congress, First Session; sec. 9, Public No. 783, 76th Congress, Third Session.)

Issued this 11th day of December, 1941.

DONALD M. NELSON
Director of Priorities.

[1] Title 32—National Defense Chapter IX—Office of Production Management, Subchapter B—Priorities Division. Part 940—Rubber and Products and Materials of Which Rubber Is a Component.

Amendment No. 1

Supplementary Order No. M-15-b is hereby amended to read as follows:

Whereas, the further importation of crude rubber is imperiled:

Now, therefore, it is hereby ordered that:

940.3 General Limitation Order

(a) Definitions. For the purposes of this order:

(1) "Rubber" means compounded liquid latex which on December 11, 1941, had not been processed or mixed in such manner that further processing is necessary to prevent early spoilage, and all forms and types of crude rubber (including crepe rubber for soles or any other purpose) and liquid latex in crude form, but does not include balata, gutta percha, gutta siak, gutta jelutong, pontianac, reclaimed rubber and scrap rubber.

(2) "Person" means any individual, partnership, corporation or other form of business enterprise.

(b) General restriction on the use of Rubber. From the date of issuance of this order until otherwise ordered by the Office of Production Management, no person shall consume, use, process, stamp, cut or in any manner change the form, shape or chemical composition of any Rubber for any purpose other than one or more of the following:

(1) To fill orders assigned on A-3 or better preference rating.

(2) To manufacture camelback in amounts not exceeding the minimum amount specified in letter dated December 5, 1941, from the Director of Priorities to manufacturers of camelback. Any manufacturer of camelback who did not receive such a letter from the Director of Priorities may use Rubber in the manufacture of camelback during any monthly period, beginning with December, 1941, in an amount not exceeding the amount of Rubber which he used in the manufacture of camelback during the month of November, 1941.

(3) To manufacture tires, tire casings and tire tubes and other rubber products necessary for the manufacture, maintenance or repair of trucks or buses which require tires of a size of 7:00x20 or larger.

(4) To manufacture these rubber products necessary for the maintenance and repair of industrial equipment or necessary to the manufacture of, but not physically incorporated in, any manufactured product other than industrial equipment. For the purposes of this subparagraph "industrial equipment" shall mean equipment used in manufacturing establishments, mining, quarrying, petroleum production and refining, telephone and telegraph systems, radio communication systems, gas, water and electric power systems, railroads, street railways and buses, but shall not include tires, tire casings or tire tubes for any vehicle.

(5) To manufacture laboratory and hospital supplies and such other health supplies as are approved under Preference Rating Order No. P-29, as amended.

(6) To manufacture heels made of black or brown composition rubber only, and rubberized fabrics, innersoles, midsoles, fillers and backing cloths to be incorporated in shoes and other footwear.

(7) To manufacture industrial rubber gloves, fabric-topped footwear made with black compounded rubber soles only, rubber boots, and industrial protective rubber clothing, galoshes with fabric tops, and plain all rubber overshoes and galoshes.

(8) To manufacture plumbers' supplies.

(9) To manufacture articles for use in preserving, canning and packing food, except rubber bands, rubber binders and similar articles used in the field or to hold packages or bundles together.

(10) To manufacture compounds for insulating wire and cable.

(11) To manufacture vulcanizing materials, patches, cement, blowout shoes and similar items for the repair of tires, tire casings and tire tubes.

(12) To manufacture cements necessary in the fabrication of finished products.

(13) To manufacture bottle nipples for feeding infants.

Provided that the use of Rubber by each such Person during any calendar month, beginning with the month of December, 1941, in the manufacture of processing permitted by sub-paragraphs (4) to (13) inclusive shall not be at rates greater than the rates of consumption in the manufacture of similar items during November, 1941, to fill purchase orders which were not assigned a Preference Rating of A-3 or better.

Provided further, that any Person who, prior to December 11, 1941, had commenced the processing of any Rubber other than compounded liquid latex in such manner that its form or chemical content had undergone a substantial change may continue such processing to completion.

(c) General Restriction on the Sale of Tires. Except to fill purchase orders assigned an A-3 or better Preference Rating, from the date of issuance of this Order until January 5, 1942, no new automobile, truck, bus, motorcycle, farm implement, or other type of tire, tire casing or tire tube, other than bicycle tires, shall be sold, leased, traded, delivered or transferred by any person, provided that the foregoing prohibition shall not apply to tires which are sold as part of new vehicles being sold and which are affixed to such vehicles at the time of their sale.

(d) Violations and false statements. Any Person who violates this Order, or who wilfully furnishes false information to the Office of Production Management may be deprived of priorities assistance or may be prohibited by the Office of Production Management from obtaining any further deliveries of materials subject to allocation. The Office of Production Management may also take any other action deemed appropriate, including the making of a recommendation for prosecution under section 35A of the Criminal Code (18 U. S. C. 80).

(e) Appeal. Any Person affected by this Order who considers that compliance therewith would work an exceptional and unreasonable hardship upon him may appeal to the Office of Production Management by addressing a letter to the Rubber and Rubber Products Branch of the Division of Civilian Supply, Office of Production Management, Washington, D. C., setting forth the pertinent facts and the reasons such person considers that he is entitled to relief. The Office of Production Management may thereupon take such action as it deems appropriate.

(f) This Order supersedes the provision of paragraph (c) (1) of General Preference Order M-15, as amended and supplemented, and all letters issued pursuant to such paragraph (c) (1).

(g) Effective date. This Order shall take effect immediately.*

(P. D. Reg. 1, Aug. 27, 1941, 6 F. R. 4469, OPM Reg. 3 amended, Sept. 2, 1941, 6 F. R. 4863; E. O. 8629, Jan. 7, 1941, 6 F. R. 191; E. O. 8875, Aug. 28, 1941, 6 F. R. 4483; Sec. 2(a), Public No. 671, 76th Congress, Third Session, as amended by Public No. 89, 77th Congress, First Session; sec. 9, Public No. 783, 76th Congress, Third Session.)

Issued this 19th day of December, 1941.

DONALD M. NELSON,
Director of Priorities.

Certified to be a true copy of the original

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Assistant to the Deputy of Priorities Office of Production Management.

Amendment No. 2

It is hereby ordered that:

A. Section 940.3 (Supplementary Order No. M-15-b) is amended as follows:

1. By changing sub-paragraph (b) (6) to read as follows:

"(6) To manufacture heels made of black or brown composition rubber only, soles, taps and soling strips made of black composition rubber only, and rubberized fabrics, innersoles, midsoles, fillers and backing cloths to be incorporated in shoes and other footwear."

2. By inserting immediately after sub-paragraph (b) (13) thereof the following new sub-paragraph designated (b) (14):

"(14) To manufacture fire hose and other essential items for fire extinguishing apparatus."

3. By substituting "(14)" for "(13)" in the proviso immediately following sub-paragraph (b) (14) thereof.

This Order shall take effect immediately.

(P.D. Reg. 1, Aug. 27, 1941, 6 F.R. 4469; OPM Reg. 3 amended, Sept. 2, 1941, 6 F.R. 4863; E.O. 8629, Jan. 7, 1941, 6 F.R. 191; E.O. 8875, Aug. 28, 1941, 6 F.R. 4483; Sec. 2(a), Public No. 671, 76th Congress, Third Session, as amended by Public No. 89, 77th Congress, First Session; Sec. 9, Public No. 783, 76th Congress, Third Session.)

Issued this 27th day of December, 1941.

DONALD M. NELSON
Director of Priorities

Rubber's Prime Substitute—Reclaim

H. O. Ghez[1]

THE war in the Pacific has made imperative the problem of increased use of substitutes for rubber. Foremost and first substitute is reclaim. The cost of rubber or its substitutes is not considered because the government has set a ceiling for the price of crude rubber, as well as for reclaim. Price control, consumption restrictions, and planting restrictions imposed by the government, or the plantation owners themselves, may well be continued after the war to avert the closing of rubber factories and the curtailment of plantation activities, such as occurred during the late depression.

Scrap rubber will always be available in this country. At present there are over 130 million tires in circulation. In the post-war period the price of scrap will undoubtedly be free, and the production and sale of reclaim at a reasonable price will continue to be a necessity, because of the continued restrictions on crude rubber. There is thus every reason for the reclaim manufacturers to enlarge their establishments at present and to build new factories either with private means or with government help. However, in view of the difficulties of obtaining materials for expansion or for new buildings, there is a quicker way, such as developed under the "Nervastral" processes, in which the production of reclaim, now in the neighborhood of 300,000 to 350,000 tons per year, can be increased materially to meet the nation's war needs. It should be remembered that present production is on a 24-hour, seven-day-week factory working basis.

The present situation calls for a wider and increased utilization of reclaim in rubber compounds. The increase of the percentage of reclaim in the various compounds is a two-fold problem:

1. In compounds normally containing reclaim, the complete displacement of crude rubber by reclaim.

2. Use of reclaim in compounds which to date contain no reclaim whatever.

One has to consider that any change of the formulas which have been used by the factories for several years may prove disadvantageous at the beginning. The manufacturer does not wish to produce an article of lower quality. He does not want to experience difficulties in his various departments, (mixing, calendering, tubing, molding, and curing). That is why, before making a decision and before changing his formulas, which would involve change of curing time, etc., the manufacturer is inclined to proceed in a cautious manner.

The manufacture of reclaim, although immense in comparison with that of other countries, cannot suffice to replace the rubber needs and, at the same time, comply in a satisfactory manner with the requirements of the civilian population. It will be necessary that other industrial establishments, capable of absorbing a certain quantity of this precious raw material, produce this substitute. One will have to consider that for the exacting production of war supplies, such as gas masks, tire treads, tank belts, etc., reclaim of first quality only can be used; whereas for articles of civilian use of lesser importance, such as soles, heels, carcasses, belts, ebonite, sponge rubber, recourse can be had to ordinary reclaim, depending upon intended use. One must never forget to make a careful discrimination with regard to reclaim, taking into consideration the ultimate use of each individual article.

Reclaims made by new methods, easy and thrifty, have mechanical and physical characteristics comparable to those of normal reclaim produced with alkali. These methods can be applied on a large scale, enabling the reclaimers to furnish more reclaim to their customers, and allowing manufacturers to utilize their scrap on the spot. Through the medium of these methods a raw material of good quality is obtained, which may be added to a great many compounds and which allows the manufacture of some articles, previously made with soft, sponge, and hard rubber, without using crude rubber.

The raw material obtained with these new methods is plastic like alkali reclaim, and has the advantages of not becoming sticky when on hot cylinders and of readily absorbing fillers.

In meeting the nation's wartime rubber needs, every possibility in respect to the increased production and use of reclaimed rubber should be thoroughly explored. Each ounce of crude rubber saved is a contribution to America's war effort.

[1] Rubber & Plastics Compound Co., Inc., 30 Rockefeller Plaza, New York, N. Y.

EDITORIALS

Remember Kota Bharu

AS AMERICANS we cannot forget or forgive the treacherous assault on Pearl Harbor by the Japanese. But Japan's thrust at Kota Bharu and into the rubber plantation lands of northern Malaya brought the effects of total war to every state of our Union. In the jungle between the Thailand border and Singapore, 300 miles to the south, is located 37% of the world's rubber production capacity. Just to the south of Singapore lies Netherland East India with 41.5% of the world's production. The capacity of these two areas, together with that of British Borneo, Sarawak, and the Burma plantations, which lie just to the west of Thailand, account for 83% of the total capacity. Already under Japanese control are French Indo-China and Thailand with 7.4% of world production. Thus 90.4% of the world's productive capacity is either in Axis hands or in immediate danger of passing into their control. Ceylon with 6% of the remaining capacity and British India with 1% are some 1,500 miles to the west of Malaya, but their position would be untenable should Singapore fall. A glance at the map reproduced on page 409 in this issue should bring home sharply the seriousness of the rubber situation in the Far East.

As we pass into this new year of 1942, America is at war—total war—not only in the islands of the Far East, but in Europe, Africa, continental Asia, and on the vast expanses of the Atlantic and Pacific. The total armed might of the aggressor nations is against us and our allies. The victor in this war will not be the one with the biggest army, but the side that produces the most planes, tanks, guns and other instruments of force and destruction. Armed might is essential to victory. And rubber is essential to the production of the instruments of modern warfare. We must be assured that a lack of rubber will not impede our war effort. Our very national existence is at stake. As this is being written American blood is being shed on the Far Eastern battlefields. British and Dutch forces are fighting to defend the vital resources of Malaya and the Netherlands East Indies.

The situation as it exists today calls for heavy sacrifices on the part of rubber manufacturers. Business as usual is out. Regulations have been issued that call for a drastically curtailed production and use of civilian rubber goods; some manufacturers may be forced to close their plants; many may suffer. But as Americans *first*, no sacrifice should be too great to bear if this means victory over the forces of aggression.

But while the battle rages in the Western Pacific and the fate of our present crude rubber supply hangs in the balance, immediate action is necessary on the home front so that we may be prepared for any eventuality. Beyond the drastic programs restricting the production of civilian rubber goods, every other means at our disposal must be used to augment our limited supply of rubber.

In the first place South America has quantities of wild rubber in remote regions that should be exploited as quickly as possible. With its recent experience in exploring the rubber-growing lands to the south, the Department of Agriculture should be in a position to help get this project under way. The reclaimed rubber industry, the mainstay of our rubber supply on the home front, is now reportedly working at capacity. But efforts should be made toward even greater production; bottlenecks, if they exist, should be located and removed. Also scrap rubber for reclaim must not be wasted, and every pound should flow into collection channels. Plans for greatly increased synthetic rubber production have been announced, and this program, although it will require time and a heavy sacrifice of labor and materials, must go on as rapidly as possible and under intelligent direction. Another important potential source of rubber is the guayule shrub which can be cultivated and grown in southwestern United States and Mexico. Legislation to promote the growth of this plant is now before Congress and should be passed soon. While this project is getting under way, the production of rubber from wild guayule in Mexico should be increased. Any other plants which yield a rubber hydrocarbon and which have possibilities of cultivation in this country should not be ignored.

We had hoped that we could greet you in this new year of 1942 with a more cheerful picture of the days ahead. Total war is here, and we must face it. But to all our friends in the industry we wish you an abundance of courage and an unswerving faith in this America of ours.

"Scorched Earth"

RECENT news accounts have indicated that the British and Dutch may pursue a "scorched earth" policy in the Far East and destroy the rubber plantations as they are forced to retreat in Malaya and the Dutch East Indies. We feel that there is little justification for this action. Japanese essential rubber needs are probably not greater than 60,000 tons annually; while Germany requires about 100,000 tons a year, of which 60,000 tons may now be supplied with synthetic production. Italy could use probably about 30,000 tons of rubber each year. The Japanese have control of French Indo-China and Thailand which together can supply at least 110,000 tons yearly.

On the basis of these figures and in view of the difficulty Japan would have to ship the rubber to Germany or Italy, there appears to be little reason to destroy the rubber plantations. On the other hand the Allies need huge quantities of rubber and are dependent on the Far East for supplies. Even though Japan gains control of this territory, it is reasonable to assume that the land will be regained by the Allies later. At that time the rubber will be needed.

What the Rubber Chemists Are Doing

A. S. M. E. Rubber and Plastics Subdivision Meets in New York

MORE than 100 members and guests attended the meeting of the Subdivision on Rubber and Plastics of the Process Industries of the American Society of Mechanical Engineers, held at the Hotel Astor, New York, N. Y., December 4. Three technical papers and a progress report were presented during the morning and afternoon sessions.

New officers of the subdivision were announced as follows: J. F. Downie Smith (United Shoe Machinery); vice chairman, Gordon M. Kline (Bureau of Standards); secretary, E. F. Riesing (Firestone); executive committee—R. A. North (Farrel-Birmingham), F. L. Yerzley (Pioneer Instrument), L. E. Jermy (*Machine Design*) and Col. G. F. Jenks (Ordnance Department, U. S. Army).

At the morning session, with Colonel Jenks acting as chairman, W. C. Keys, United States Rubber Co., spoke on "Vibration and Rubber Springs"; while F. L. Yerzley, Pioneer Instrument Division, Bendix Aviation Corp., and Gordon M. Kline, Organic Plastics Section, National Bureau of Standards, presented a progress report entitled "Advances in Rubber and Plastics During 1941." A résumé of Mr. Keys' paper is given below, as is that portion of the progress report which deals with rubber which was prepared by Dr. Yerzley, with the cooperation of F. C. Thorn, Garlock Packing Co., G. H. Kaemmerling, Lord Mfg. Co., T. H. Peirce, H. A. King Co., and Mr. Riesing. Highlights of Dr. Kline's report on plastics were: plastic production in 1941 was up 50% from 1940; there were no outstanding developments in new materials; improvements cited included urea resins in adhesives, melamine resins in molded goods, and the reenforcement of phenolic plastics; progress in plastics from soy beans and lignin was reported; continuous extruding has made considerable progress, resulting in metal replacement in some cases; the rubber bag molding process has been successfully applied to the production of airplane parts; ion exchange applications of plastics has utilized the chemical properties of these materials.

L. W. Wallace, vice president, Trundle Engineering Co., acted as chairman at the afternoon session, during which H. N. Haut, Bellanca Aircraft Corp., spoke on "The Uses of Plastics in Various Ways in Airplane Construction", and G. E. Landt, Continental Diamond Fibre Co., presented a paper entitled "Plastics."

At a session on vibration, held on December 1 under the auspices of the Applied Mechanics Division, C. O. Harris, of the Illinois Institute of Technology, spoke on "Some Dynamic Properties of Rubber." Mr. Harris reported on two properties of rubber bonded to metal; internal damping and dynamic modulus of elasticity. Two types of specimens were tested: rubber cylinders bonded to steel cylinders at ends and stressed in compression, and specimens of rubber bonded to steel, stressed in shear. As a result of his investigations the author concluded: (1) for cylinders in compression and specimens in shear, the damping can be expressed in terms of a velocity coefficient. The damping decreases with increase of frequency; it increases with increase of static strain; (2) The dynamic modulus of elasticity is slightly larger than the static modulus and is not affected by change of frequency. It increases with increase of static strain for the cylinders and decreases for the shear specimens. (3) For cylinders in compression, both damping and modulus of elasticity are dependent upon the ratio of diameter to length.

Keys on Vibration

A demand for machinery quiet in operation and free of vibration has followed the improvement in smoothness of the American automobile, Mr. Keys said, and because rubber is a poor conductor of sound and can be economically fabricated into effective springs or mountings, it is much used as a structural material in many types of mechanisms.

Illustrated with charts and reproductions of experimental records, the paper dealt with rectilinear vibration and presented practical applications of rubber, typical quantitative results, and data as to resonance frequencies of vibratory movements of mountings made of typical rubber compounds bearing typical safe loads and subjected to a range of vibrations encountered in actual performance.

According to Mr. Keys, the engineer requires generally the following information in attacking problems involving isolation of vibration by means of resilient supports: (1) total weight to be supported; (2) location of center of gravity; (3) lowest frequency of vibration to be insulated; (4) directions and plane of the vibration; (5) reactions (if any) to be resisted by the mountings (such as torque, forces due to driving belts, chains, gears, etc.); (6) number, location, and size of attaching belts; (7) type, location, and size of all connections from resiliently supported unit to foundation members (such as conduits, piping, driving shafts, etc.); (8) the "rate per inch" or spring constant of such connections; (9) type of supporting foundation; (10) clearances between parts of supported unit and adjacent members not supported by the mountings; (11) proximity of oil, water, temperature, exposure to sunlight or ozone; and (12) as complete information as possible regarding the conditions of use.

To determine the relation between actual resonance frequencies and calculated ones obtained by using rubber stressed in both shear and compression standard mountings, 1¼ inches diameter by 1.09 inches effective rubber length, made of five standard mounting compounds, were used. Tests were also made on structural cellular rubber.

A weighted platform was supported by the mountings under test which was made to vibrate by a double eccentric weight arrangement which produced vertical vibratory forces without comparable horizontal ones. The eccentrics were driven at rates of from 250 to 1,750 cycles per minute by a variable speed motor. The speeds were established by a strobotac. A General Electric velocity meter was used to obtain vibration velocities, and the amplitudes of vibration were measured by a dial gage in contact with the platform.

The number of mountings embracing a determined rubber compound was chosen to give about the same static reflection with approximately the same weight as samples of other compounds stressed in the same way.

Mr. Keys' tests determined that the amplitude of resonance is much less for the harder compounds. These, he said, are seldom used because their cost for a given deflection is higher and they are more susceptible to permanent set than soft compounds. He concluded that the life of rubber mountings depends solely on the stress and abuse which they receive and that under opportune circumstances rubber mountings should function adequately for six years.

Report on Rubber by Yerzley

This is the second annual report (1) to the Rubber and Plastics Subdivision on progress during a calendar year in the mechanical technology of rubber and plastics. In a very real sense it is a résumé of many contributions made by mechanical engineers and the technologists of the rubber and plastics industries to the security of freedom. No sincere issue can be taken with the view that our major effort now must be for defense, but the longer view which also cannot be forgotten is that developments under the stress of these times will carry over into peacetime benefits.

When the year 1941 was young, the anti-Axis powers faced incredibly efficient mechanized forces with commendable courage and appalling deficiencies of material and manufacturing capacity. As the year closes, the balance is swiftly changing. This country is on the verge of unparalleled production of

the implements of war. Entwined in this great program and essential to it is the increasing influence of both rubber and plastics. New concepts of production, design, weight, assembly and style are developing, and engineers who keep abreast of the tide can best anticipate future technical needs and price competition.

Although, for commercial reasons, the products of today must in general wait for open technical description until tomorrow, every application indicates a trend, and every trend is based upon substantial technical progress illustrated by the applications. Hence the available literature has significance beyond the details it contains, and suppliers and designers alike can well afford to study it and cannot afford not to if they intend to keep abreast of the swift moving tide of modern design.

For lack of any more generally acceptable terminology the word rubber is used in this report in its broadest sense, and distinction is made between natural and synthetic rubber only when it is particularly important to do so. To a designer, the source is immaterial, the performance, paramount, and all generalizations must be qualified without exception by the assumption that each competent designer will know the characteristics required for the performance of a given part and that he will label his requirements by full specifications to prevent installation of inadequate materials. At the same time the designer must know that when two parts can be made satisfactorily of the same composition, there is much to be gained in uniformity and economy by using the same material specification for both.

The diversity of products required by the armed forces is suggested by the following partial list of products being made by one of the large rubber companies:

Tank track blocks and bushings
Half tracks
Hatch gaskets
Motor mountings
Bogie tires
Self-sealing tubes
Self-sealing gas tanks
Self-sealing fuel and oil hose
Latex sponge parachute pads
Latex wing fillers
Latex pilot seat pads
Rubber cement
Various gas masks parts consisting of
  (a) Flat faceblanks
  (b) Fully molded faceblanks
  (c) Outlet valves
  (d) Deflectors
  (e) Hose tubes
  (f) Various gaskets
Friction tape
Rubber tape
Radiator hose
Barrage balloons

Further expansion of this theme is found in the literature (2, 3). There is little technical information in published literature specifically related to defense items. There are extremely important developments under way, however, on motor supports, particularly for aircraft power plants. We are indebted to a private source for the following information.

Perhaps of primary importance in the aircraft engine mounting field has been the standardization and adoption of Dynafocal Suspension for the mounting of large radial engines. Dynafocal Suspension is the trade name applied to a directional spring mounting system so arranged as to obtain a virtual center of gravity suspension, even though the mountings are necessarily attached to the rear of the engine. By its use isolation of all types of vibratory disturbances arising from the engine-propeller combination can be achieved without the introduction of an undue amount of instability such as usually would occur with an overhung suspension made adequately soft to give the desired isolation.

In these suspensions the use of shear stressed rubber as the flexing medium has been employed as being the most efficient and easily applied method of achieving the flexibility. Designs are of two types, the link type and the flexible pedestal, or inclined sandwich, type. In the link type, Dynafocal Suspension, bonded rubber tube form mountings are arranged tangentially to a circle, the center of which is the crankshaft center line, and connection is made to the structure by means of links which are inclined toward a focal point slightly ahead of the center of gravity.

In the pedestal type, bonded rubber sandwich-type mountings are used, with the sandwiches inclined so that focal lines drawn normal to the plane of the sandwich would again meet at a point slightly in advance of the center of gravity of the supported assembly.

The use of rubber mountings in aircraft for shock and vibration control has become standard procedure. The most common applications are on instrument panels, radio, individual instruments, and cowls. Both radial and in-line engines are usually mounted on rubber mountings.

Extensive additions have been made to the variety of commercial mountings, and it is fair to assume that the number will continue to increase. The following data on mountings for compressive loads appeared recently (4):

	Mounting Load Pounds	Minimum Disturbing Frequency Cycles per Minute
A	250	850
B	150	1200
C	85-100	1250

The impelling motive behind most applications of rubber springs for mounting purposes is the reduction of vibration in all classes of machinery. An important analysis of vibration in automobiles (5) was presented. Intensive work is being conducted in laboratories throughout the country on mounts for all types of internal combustion engines in marine, railway, automotive, and aviation equipment. Further refinements and novel improvements can be expected.

The automotive industry has continued to lead in the application of rubber. Wide rim pneumatic tires have been introduced (6) for which greater riding comfort and road stability are claimed. A variety of rubber and synthetic rubber parts have been added to automobiles and have been described in excellent papers (7, 8, 9).

During the year semi-conducting rubber has come into large-scale commercial production. It is made by the inclusion of specific types of carbon black in the compound. Application is found in quantity wherever static electricity must be dissipated. Industrially the explosives, petroleum, and transportation industries afford the biggest markets for belting, footwear, and tires. Static elimination in the operation of automobiles prevents the danger of shock and improves radio performance (10, 11, 12).

Compression and stress decay in rubber gaskets often are serious questions in design. An analysis of experimental results lead to the following recommendations for longest useful life (13):

1. Roughened flanges and absence of lubricating paste.
2. High initial load short of the crushing strength of the material.
3. Thin gaskets.

Vibration isolation has continued to pose the question regarding the possibility of making rational analysis, related to practical application of the damping (hysteresis) properties of rubber. Reports expressed from several sources indicate that ideal spring systems can be obtained by the proper combination of metallic and rubber spring components. Large harmonic balancers of the torsional type are being installed in production on the crankshafts of marine diesel engines.

Further tests have been reported bringing out additional information on the mechanical characteristics of rubber. One interesting paper deals with a variety of spring shapes and the relative importance of shear, tension, and compression in the overall spring rate (14). Static fatigue life was studied comprehensively by other investigators, and important information on permissible stresses and strains is indicated (15). An especially valuable paper (16) on the creep of natural and synthetic rubbers over periods as great as 900 days was presented before this Subdivision, probably to become the cornerstone of extensive literature on this subject. A paper on the creep of neoprene provides supplementary information (17). Several synthetic rubbers are compared in various ways in a timely paper presented to automotive engineers (18).

While product engineers have been given the spotlight, process engineers have been active on important factory problems. One engineer visualizes rapid transition of the rubber industry from batch processing to continuous processing (19). Another engineer called attention to the ever important problem of safety on mills and calenders (20).

Maintenance of raw material supply was especially interesting in connection with synthetic rubber. The question was dealt with in lucid and important papers (21, 22). Production estimates for all types are well over 22 million pounds for the year with predictions for 1942 far in excess of this amount. This estimate includes both oil-resistant and other types.

The synthetic rubber picture is made

more interesting by the continuance and acceleration of research. During the year gradual development of all types has made them more useful and more readily processed. In addition, major contributions to rubber technology have been marked by two entirely new types of neoprene, one of which can be plasticized to putty-like consistency before vulcanization, the other an oil-resistant material having freeze resistance comparable with that of rubber.

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Frolich A.C.S. President-Elect

PER K. FROLICH, director of the chemical division, Esso Laboratories Standard Oil Development Co., Elizabeth, N. J., was elected president, to take office January 1, 1943, of the American Chemical Society. Dr. Frolich is well known for his work on synthetic rubber as well as many other important developments.

Rubber Division, A. C. S., Activities

Buffalo Group Holds Christmas Party

THE Christmas meeting of the Buffalo Group, Rubber Division, A. C. S., was held at the Westbrook Hotel, Buffalo, N. Y., December 18, 1941. J. M. Cranz, entertainment chairman, acted as master of ceremonies for the variety show that followed dinner, and he also took charge of the distribution of gifts.

Officers for 1942 elected by written ballot are: chairman, John S. Plumb (U. S. Rubber Reclaiming), reelected; vice chairman, Burt W. Wetherbee (Globe Woven Belting); secretary-treasurer, Howard Wiley (U. S. Rubber Reclaiming).

The date and program of the February meeting will be announced later. An international meeting with the Canadian sections will be held May 1 in Niagara Falls, Ont.

A large number of attractive gifts distributed at the party were donated by the following firms:

Akron Chemical Co.; L. Albert & Sons; American Cyanamid & Chemical Corp.; American Zinc Sales Co.; Libb Mfg. Co.; Binney & Smith Co.; Continental Carbon Co.; Godfrey L. Cabot, Inc.; Callaway Mills; J. M. Cranz Co.; E. I. du Pont de Nemours & Co., Inc.; Farrel-Birmingham Co., Inc.; General Atlas Carbon Division of General Properties Co., Inc.; Globe Woven Belting Co.; International Smelting & Refining Co.; C. P. Hall Co.; Hycar Chemical Co.; INDIA RUBBER WORLD; James O. Meyers; Monsanto Chemical Co.; H. Muehlstein & Co., Inc.; New Jersey Zinc Sales Co.; Niagara Sprayer & Chemical Co.; Philadelphia Rubber Works Co.; Rolls Chemical; *Rubber Age*; A. Schulman, Inc.; Henry L. Scott Co.; Stanco Distributors, Inc.; Standard Chemical Co.; Thiokol Corp.; Titanium Pigment Corp.; U. S. Rubber Reclaiming Co.; United Carbon Co.; R. T. Vanderbilt Co., Inc.; Xylos Rubber Co.

Boston Group Holds Winter Meeting

THE Boston Group, Division of Rubber Chemistry, A. C. S., held a dinner meeting December 12 at the University Club of Boston, Mass., attended by 225 members and guests. The Farrel-Birmingham Co., Inc., sound pictures "Rubber at the Rouge" and "Robots and Rubber" were presented as a double-feature event of the evening. Later more than 60 prizes were drawn by those holding winning numbers. Officers chosen for 1942 included: chairman, Donald D. Wright (Hood Rubber); vice chairman, Lawrence R. Clarke (Haartz-Mason-Grower); secretary-treasurer, Thomas R. Knowland (Boston Woven Hose), executive committee, Frank Ward (Panther-Panco), and Joseph L. Haas (Hodgman Rubber).

Akron Group Meets January 30

THE winter meeting of the Akron Group, Division of Rubber Chemistry, A. C. S., will be held at the Akron City Club, Akron, O., January 30 at 7:00 p.m. Three short films descriptive of Ohio will be presented by the Standard Oil Co.

Traflet Elected Chairman at New York Group Party

THE New York Group, Rubber Division, A. C. S., held its annual Christmas party on December 12 at the Building Trades Club, 2 Park Ave., New York, N. Y., with 420 members and guests attending. Dinner was followed by the election of 1942 officers, music, entertainment by comic monologists, and the distribution of more than 190 attractive gifts to holders of winning tickets.

Officers elected for 1942 are: chairman, F. E. Traflet (Pequanoc); vice chairman, J. H. Ingmanson (Bell Telephone Lab.); sergeant-at-arms, M. E. Lerner (*Rubber Age*); secretary-treasurer, Peter P. Pinto (*Rubber Age*). The executive committee for 1942 includes for the three-year term: J. W. Crosby (Thiokol), O. J. Lang (Armstrong Rubber), H. G. Bimmerman (Du Pont); for the two-year term, R. E. Casey (Naugatuck), Lawrence Edlund (Vanderbilt), G. J. Wyrough (Whitehead Bros.); for the one-year term, M. R. Buffington (Lea Fabrics), W. F. Tuley (Naugatuck), D. A. Shirk (Rare Metal Products). B. B. Wilson (INDIA RUBBER WORLD) will serve as ex-officio member of the executive committee.

The unusual variety of useful and handsome gifts distributed as the popular climax of the evening were made possible by the generosity of the following firms:

Advance Solvents & Chemical Corp.; L. Albert & Son; American Cyanamid & Chemical Corp.; American Zinc Sales Co., Inc.; Anaconda Sales Co.; Ansbacher-Siegle Corp.; J. T. Baker Chemical Co.; Binney & Smith Co.; Black Rock Mfg. Co.; Godfrey L. Cabot, Inc.; Carter Bell Mfg. Co.; Cleveland Liner & Mfg. Co.; Columbia Chemical Div., Pittsburgh Plate Glass Co.; Continental Carbon Co.; E. I. du Pont de Nemours & Co., Inc.; Farrel-Birmingham Co., Inc.; Flintkote Co., Inc.; General Atlas Carbon Div., General Properties Co., Inc.; Givaudan-Delawanna, Inc.; C. P. Hall Co.; J. M. Huber, Inc.; INDIA RUBBER WORLD; I. B. Kleinert Rubber Co.; Midwest Rubber Reclaiming Co.; Monsanto Chemical Co., Rubber Service Dept.; Moore & Munger; H. Muehlstein & Co., Inc.; National Rubber Machinery Co.; National Sherardizing & Machine Co.; Naugatuck Chemical Div., United States Rubber Co.; New Jersey Zinc Co.; Pequanoc Rubber Co.; Philadelphia Rubber Works Co.; Rare Metal Products Co.; Revertex Corp. of America; *Rubber Age*; St. Joseph Lead Co.; A. Schrader's Son; A. Schulman, Inc.; Henry L. Scott Co.; Southwark Mfg. Co.; Speed Products, Inc.; Stamford Rubber Supply Co.; Standard Chemical Co.; C. J. Tagliabue Mfg. Co.; Textile Proofers, Inc.; Thiokol Corp.; Thompson, Weinman & Co., Inc.; Titanium Pigment Corp.; Tyson Corp.; United Carbon Co.; R. T. Vanderbilt Co., Inc.; Vansul & Co.; C. L. Williams Co.; and Wishnick-Tumpeer, Inc.

Los Angeles Group Elects 1942 Officers

THE Los Angeles Group, Rubber Division, A. C. S., Christmas meeting at the Hotel Mayfair, Los Angeles, Calif., December 2 was attended by more than 165 members and guests. Officers elected for 1942 were: president, Gaelen K. Norton (Kirkhill Rubber); vice president, Charles J. Roese (Goodyear Tire); secretary, Curtis R. Wolter

(*Continued on page* 385)

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(Kirkhill); treasurer, L. F. McDonald (Goodrich); executive committee, Edward L. Royal (H. M. Royal, Inc.), Carl E. Stentz (Latex Seamless Products), and Phillip W. Drew (Goodyear).

Donors of a variety of useful door and special prizes distributed at the meeting included: Dili Mfg. Co., Johnson Steel & Wire Co., H. Muehlstein & Co., Inc., Naugatuck Chemical Division, United States Rubber Co., B. E. Daugherty, Robert Badenhop Corp., D. Hecht & Co., H. M. Royal, Inc., and R. C. Nicoll.

The first meeting of 1942 will be held February 3.

Chicago Group Entertains Ladies at Christmas Frolic

THE Chicago Group, Division of Rubber Chemistry, A. C. S., held its annual Christmas Frolic, December 19 in the Gold Room of the Congress Hotel, Chicago, Ill. Three hundred members and their guests attended the dinner which was preceded by a reception. Eddie Peabody, a Lieutenant-Commander of the United States Navy, one of the several features of a two-hour variety show, appeared through special permission of the naval authorities.

Souvenirs distributed to the ladies were the gifts of rubber manufacturers and chemical supply firms in the Midwest, a list of which will be published in a forthcoming issue.

At the next meeting, February 5, A. A. Somerville, of the R. T. Vanderbilt Co., will address the Group on "Weather Aging."

Quebec Group Meets at McGill University

THE Quebec Rubber & Plastics Group dinner meeting, December 5, at the Faculty Club, McGill University, Montreal, P. Q., Canada, was attended by a large number of members and guests who included several instructors and students of the Royal Canadian Air Force Aeronautical Engineering School of Montreal. J. M. Crosby, technical sales manager of Thiokol Corp., addressed the group on wartime uses of synthetic rubbers. Mr. Crosby discussed such aircraft production problems as the development of bullet-proof gas tanks and fuel lines with comparisons of American, English, and German planes.

The address of W. M. Davidson, general manager, Bakelite Corp. of Canada, at the January 9 meeting, designated Bakelite Night, will be supplemented by a motion picture supplied by the Bakelite Corp.

Subsequent meetings will be held on the first Friday of each month with discussion subjects alternating between rubber and plastics.

A. B. Lewis, chief chemist, British Rubber Co. of Canada, Ltd., 55 Ouimet St., St. Laurent, P. Q., is handling publicity for the Group.

Ontario Group Hears Tuley on Chemical Supplies

THE Ontario Rubber Section, Canadian Chemical Association, met December 11 at the University of Toronto, Toronto, Ont. After dinner in Hart House members and guests adjourned to the Chemistry Building where W. F. Tuley, sales manager for rubber chemicals and reclaim, Naugatuck Chemical Division of the United States Rubber Co., spoke on "Wartime Chemical Supplies for the Rubber Industry." Because armies of 1941 travel on rubber, the rubber industry finds itself in an important key position of defense, Dr. Tuley said. His address covered the present supply situation of rubber compounding materials in the light of recent war declarations by the United States and Japan and stressed the fact that since rubber manufacturers are providing essential parts of military equipment, the controlling authorities must recognize that the rubber industry cannot maintain its production volume of high quality and low price if the supply of organic materials is curtailed.

Production capacities of the chemical industry were compared with those during the 1914-18 war, and it was pointed out that aniline production in 1939 was 29 times the 1914 supply, nearly all of which was imported. In spite of the recent scarcity of aniline, formaldehyde, B-naphthol, acetone, alcohol, phenol, salicylic acid, phthalic anhydride, chlorine containing chemicals, sulphuric acid, caustic soda, and zinc oxide, Dr. Tuley said that so far no rubber plant had lost production because of the allocation of shortness of materials, other than that due to the restriction of crude rubber itself.

Utilizing Canadian minerals, sulphur, phosphorous, salt, natural gas, and coking oven by-products, chemicals needed by the rubber industry, such as aniline, phthalic anhydride, and carbon disulphide are now being manufactured in the Dominion, and the new plant being constructed by the Naugatuck Chemical Division at Elmira, Ont., will provide the first facilities for making antioxidants in Canada, as well as add to the supply and variety of accelerators made there, Dr. Tuley stated.

Emulsified Nypene Resins for Latex

EMULSIONS of Nypene Resin, a terpene polymer, are claimed to give the same degree of softening and tack to rubber latex films as solid Nypene when milled into rubber, and reportedly have the added advantages of extending the latex and imparting increased tensile strength to the film. Three basic types of Nypene Resin Emulsions have recently been produced by the Neville Co., Pittsburgh, Pa., for use with rubber latex, emulsions of reclaimed rubber, synthetic rubber latices, carnauba wax emulsions, and alkyd resin emulsions. All are reported to have unlimited miscibility with water and definite stability in which no separation occurs in four to eight weeks.

Nypene Dispersion Type 1800 blends with rubber latex in any proportion. Opaque films having a mild tack or a hard dry feel with ample flexibility are obtained by varying the ratio of ingredients. The films possess good adhesive qualities to non-porous surfaces such as glass and metals. Having the consistency of a mobile liquid, the resin content by weight of this type is about 60%, and the mean colloidal size is one micron (diameter).

Type 1802, which can also be mixed in any proportion with rubber latex, produces cohesive, continuous, and clear films. Depending on the ratio of solids used, films that are tacky and soft, firmer with pressure sensitive properties, or dry and hard with low softening points are obtained. The adhesion of the film to non-porous surfaces is greatly improved over that of latex alone. This type has the consistency of a viscous paste; its mean colloidal size is between one and 2½ microns (diameter), and its resin content by weight is approximately 50%.

Type 1808 produces films that vary from soft and tacky to hard and tough, depending on the ratio of emulsion to latex. It is suggested that these wide variations of properties make it useful for the development of new products using rubber latices. The mean colloidal size is between one and 2½ microns (diameter) and the emulsion has the consistency of a viscous paste. Two types of No. 1808 are available. Type A has a resin content of 50% by weight and produces a cohesive continuous film, which is slightly translucent. Type B has a resin content of 58% by weight and produces a clear film, also cohesive and continuous.

Correction

THE paper, "A Torsional Hysteresis Test for Rubber",[1] by M. Mooney and R. H. Gerke, contains some errors in definition which were brought to the authors' attention by Dr. P. J. Flory. The definitions of a and b immediately following equation (8) should read:

$2a$=cut thickness of the test piece.

$2b$=cut width of the test piece=width of the die.

[1] INDIA RUBBER WORLD, Jan. 1, 1941, pp. 29-32.

Rubber-to-Metal Adhesion[1]

AN ADHESION of rubber or neoprene to metal which is superior to that obtained by vulcanizing rubber or neoprene in direct contact with metal is obtained by applying a cement of rubber chloride, organic accelerator, and sulphur to the metal; evaporating the solvent; placing a layer of vulcanizable rubber over the rubber chloride composition; and vulcanizing.

[1] From U. S. patent No. 2,259,190.

New Machines and Appliances

"Lightnin" Air-Driven Mixer

Air-Driven Propeller-Type Mixer

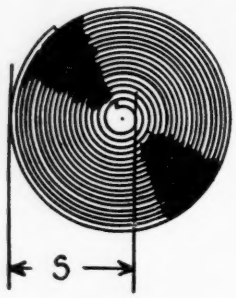
THE "Lightnin" air-driven propeller-type mixer has a turbine-type air motor especially designed for agitator work and is the first mixer with this type of propulsion offered by the firm. This new mixer is built for operation at air pressures of from 60 to 120 pounds per square inch with the optimum operating range between 70 and 90 pounds. A throttle permits varying speeds for different mixing operations, and the speed varies with the load and with variations in the air pressure. A Universal lamp, which permits the mixer to be used at any angle in the container, provides control over the mixing action so that the operator may obtain intentional vortexing, mild swirl, or rapid bottom-to-top turnover. The mixers can be adapted to containers of different sizes by adjusting the shaft length.

The mixer is made in two models which have built-in mufflers for quiet operation. Model AR-25 weighs 25 pounds, operates at 1750 r.p.m. and has a 36-inch shaft with a three-inch propeller. Model AR-33 weighs 29 pounds, operates at 400 r.p.m. and has a 36-inch shaft with a seven-inch propeller. Mixing Equipment Co., 1029 Garson Ave., Rochester, N. Y.

Formula for Estimating Length of Rolled Rubber

A FORMULA for computing the length of rubber in rolls—hose, belting, rubber covered wire, etc.—and other rolled materials, derived by W. F. Schaphorst, consists of simple calculations. A distance "S" from the outer circumference of the roll to the first coil beyond the center (see diagram) is multiplied by the number of loops. The product is multiplied by a constant, 0.2618, to obtain the length of the roll in feet.

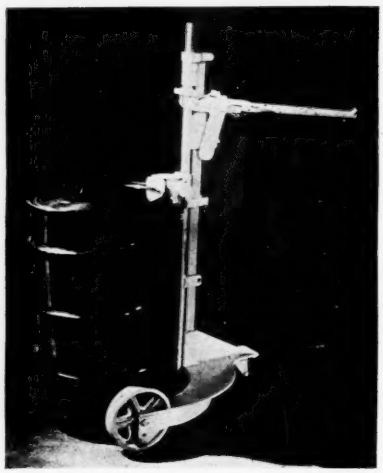
The thickness of the material measured or the degree of tightness with which the roll is found does not affect the application of the formula.



S × No. of Loops × 0.2618 = Length (Ft.)

U-C Level Indicator

Model XL Sander



Little Giant Magic Carrier

Carrier for Handling Drums

THE Little Giant Magic Carrier, designed and constructed for handling litherage drums, has a capacity up to 600 pounds. One man can operate the loaded carrier, and a simple lifting device and self-balancing tri-wheel are said to obviate accidents common to the handling of heavy containers. Copper silicon alloy metal wheels and a locking device are available where precautions against explosions are necessary. Ernst Magic Carrier Sales Co.

Level Indicator for Drums

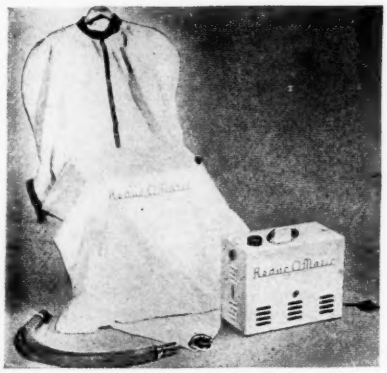
THE U-C Level Indicator, which fits all standard 55-gallon steel drums, offers a constant method of checking drum contents. Easily attached, it is screwed into the drum faucet opening, and then the drum faucet is inserted into the opening of the indicator body. The working principle consists of a cork float mounted on a wire rod, while the level is indicated on a gage installed on the external fitting. U-C Level Indicator Sales, Division of Marketing, Inc.

Sander for Finishing Rubber Products

MODEL XL EASY ELECTRIC SANDER has reportedly been found useful by fabricators of rubber products for such purposes as sanding vulcanized rubber sheets and the hard rubber covers on the hubs of aircraft propellers and for cleaning rubber molds. This lightweight (6½ pounds) machine is available with either a 110 or 220 volt motor, and all moving parts are mounted on grease-sealed ball-bearings. Improved features include a filter built into the motor cover which re

(*Continued on page* 416)

New Goods and Specialties



Reduc-o-matic

Reducing Garment

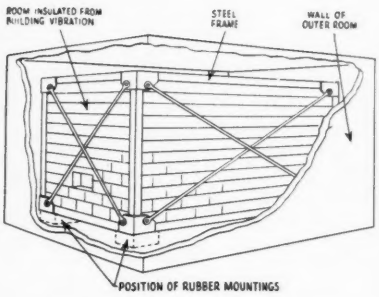
THE Reduc-o-matic consists of a transparent waterproof rubberized garment, with a zipper opening, that envelopes the body, and a unit, containing an electric motor, which projects a flow of moist warm air through a rubber hose connection into the loose fitting bag. It is said that the Reduc-o-matic creates a more rapid flow of blood to the skin, increases metabolism, and induces perspiration which results in loss of weight. Made by the Marlowe Mfg. Co., this machine is sold by Abercrombie & Fitch Co.

Rubber Quill Holder for Silk Weaving Shuttle

A MOLDED rubber quill holder for retaining the tube or quill of yarn in place during the weaving is said to stay firmly in the shuttle because of its shape. The holder securely fits the spindle head and the metal base and barrel of the quill and the special excavation of the shuttle into which it slides. The construction is said to reduce vibration, hold the tube of yarn in close alinement with the shuttle eye, protect the metal shields of the tubes, and eliminate the moving of the quill on the spindle. Southern Shuttles Division, Steel Heddle Mfg. Co.

Room Mounted on Rubber

MORE than 98% absorption of sound is said to be achieved in an experimental room for tests of vibration in machinery and musical instruments and for tests of the sound absorbing qualities of construction materials at the Technological Institute on the campus of Northwestern University. This room, which is enclosed in another room, is 14½ by 13½ feet, weighs 50 tons, and is set on special rubber mountings which were designed by the United States Rubber Co. to tune out vibrations and absorb noise-producing



World's Quietest Room—Sectional View Showing Rubber Mountings

shocks. Since all but the lowest building vibrations are excluded, complete silence is said to be effected in this room, which is described as the "world's quietest." Built of concrete, there are 18 layers of carefully spaced muslin plus other sound insulating materials lining the walls.

The construction was in itself unusual, for the ceiling was made first and lifted from the ground by jacks while the walls were built under it. Three jacks built into the floor structure will permit raising the room if it should become necessary to replace the rubber mountings underneath.

Two additional soundproof rooms of similar construction are planned for erection in the Institute building to make possible more extensive research in sound problems as psychologists urge quieter living conditions as an antidote

Rubber Quill Holder

Single Filter Dustfoe Respirator

Bell Telephone Laboratories

Rubber Handset for Telephone Lineman

for added work and strain resulting from the war and war materials production.

Molded Rubber Handset for Linemen

A LIGHT, small, and compact handset for telephone installers has a handle, molded in one piece of resilient rubber, which holds the instruments and protective grids over the transmitter and receiver without threaded caps. It is said to possess improved transmission characteristics and to be more resistant to mechanical shock and damage from handling than the former metal handle type. Each end of the handle is split to permit the insertion of the instruments, and the split ends are held together by small bolts the heads and nuts of which are embedded below the surface of the handle. Bell Telephone Laboratories, Inc.

Single Filter Respirator

PROTECTION against dusts and mists is afforded by a lightweight, compact Dustfoe respirator whose reported improvement is a replaceable single filter which supersedes the previously used two-unit felt screen and cellulose filter. Large dust particles are first filtered on the more porous outer side which prevents a clogged filter.

Retained features are a replaceable sponge rubber face cushion which assures the wearer comfort, a face-piece adjustable to individual contours, and a United States Army Gas Mask type exhalation valve which closes with each inhalation to provide drainage of condensation.

The respirator is available with Type AC Single Filter for pneumoconiosis-producing (silica, asbestos) and nuisance dusts and mists, or with All-Dust Single Filter for applications where a variety of dusts, including such toxic dusts as lead, cadmium, manganese, and the like are present. Mine Safety Appliances Co.

UNITED STATES

Japanese Invade Malaya—Our Civilian Rubber Production Is Decreased 80%

Tires to Be Rationed; Synthetic Production to Be Tripled; No Restriction on Use of Reclaim; Action Taken on Prices

Drastic curtailment of civilian rubber production, as covered in Supplementary Order No. M-15-b to Restrict the Use of Rubber and in Amendment No. 1 to Supplementary Order No. M-15-b (see pages 376-78) followed the outbreak of hostilities between Japan and the anti-Axis powers on December 7. Then tire sales were prohibited from December 11 through January 4, and a rigid tire rationing plan was announced December 26. Although no restrictions have yet been imposed on the consumption of reclaimed rubber, prices were frozen at the level of December 5. At the same time scrap dealers, suppliers of guayule, and manufacturers of rubber footwear, soles, heels, and shoe machinery were asked not to raise prices. The government has announced plans for tripling synthetic rubber production, and action is indicated on guayule legislation.

Jesse Jones, Secretary of Commerce and Federal Loan Administrator, who appeared before the Senate Military Affairs Committee on December 10 in behalf of guayule legislation, declared that available supplies of rubber are enough for about a year, but with a rationing system in effect and increased production of synthetic rubber, current supplies could be stretched enough to meet absolute essentials for a period of 2½ years.

Tentative Rationing Plan Announced by Henderson

The following statement was issued December 17 by Leon Henderson, administrator of the Office of Price Administration and director of the Division of Civilian Supply, Office of Production Management:

"Spread of the war to the East Indies area threatens the future importation of rubber into this country. Approximately 50% of crude rubber comes from land areas already occupied or being invaded by the Japanese. Another 43% comes from the adjacent Dutch and British Islands of Sumatra, Java, and Borneo, all of which are threatened by the Japanese.

"This means that consumption of rubber products already manufactured and of crude rubber must be conserved by every possible means until the outlook for future crude rubber imports is cleared up.

"At the present time this country has on hand a substantial stockpile of crude rubber and large inventories of manufactured goods held by producers and dealers.

"However, expanding needs of the military forces plus the uncertainty over the possibility of getting further imports make it imperative at this time that we cut down our civilian consumption to not more than 10,000 tons of crude rubber per month. This is taking a pessimistic view of the situation, but no other attitude is justified in the present emergency.

"Consumption of crude rubber for production of civilian goods in recent months has been running at a monthly rate of around 47,000 tons. It is obvious that we will have to reduce this consumption of crude rubber by nearly 80%.

"Approximately 75% of crude rubber consumed in this country normally goes into tires. A small amount of the balance, aside from non-tire military needs, goes into such products as golf and tennis balls, bathing apparel, stationers goods, toy balloons, etc. Manufacture of such products can be eliminated entirely. But most of the balance goes into essential mechanical goods and other products such as fire hose, transmission and conveyer belts, packings, friction tape, jar rings, surgeons' gloves, hot water bottles, syringes, protective clothing, and thousands of other products. Substantial amounts of reclaimed rubber are available, but will have to be used in large part to replace crude rubber in the manufacture of mechanical goods and other products. Likewise, a substantial part of the 10,000 tons of crude rubber available per month for civilian goods will have to be used in manufacture of such products. Amounts of synthetic rubber available in the near future will be very small. This means that only a part of the 10,000 tons per month of residual supply will be available for tire production.

"At the present time there are between 7,000,000 and 8,000,000 new tires in stock in this country. In recent months replacement tire sales have been running around 4,000,000 tires a month or 48,000,000 a year. It is obvious that existing stocks on this basis would be adequate to meet only about two months' normal requirements.

"The government moved to meet this situation on December 11 by imposing a ban on sales of new tires, except for those buyers having priority ratings of A-3 or higher. This ban was to extend to December 22, during which period it was hoped that a rationing plan could be perfected. Much progress has been made on development of this plan through the combined efforts of the Division of Civilian Supply of OPM and the Office of Price Administration. It will be necessary, however to extend the ban on new tire sales through January 4 to complete preparation of the rationing plan.

"Basic framework of a tentative rationing plan has been worked out, however, and I want to review its principal features:

"(1) For the time being production of new passenger car tires will be almost entirely eliminated, and production of new truck tires will be curtailed.

"(2) A monthly quota of tires which can be sold in the United States and its possessions will be determined on the basis of the amount of crude rubber which can be used in production of new tires.

"(3) These monthly quotas will be broken down into state and county quotas primarily on the basis of commercial vehicle registrations in each area.

"(4) State and local rationing boards are being set up by Frank Bane, director of field operations, OPA, through state defense councils. The state boards will serve largely as clearing agencies for information passing between the federal government and local boards.

"(5) Sales of new tires will be limited to individuals and agencies requiring them for the maintenance of industrial efficiency and civilian health. These will include the following broad classes: vehicles required for the maintenance of public safety and health; passenger transportation equipment, exclusive of private passenger cars; and a limited group of essential truck operators. Details of this list of users who will be permitted to buy new tires will be issued within a few days. In any event sales of new tires to owners of private passenger cars will be virtually prohibited for the present.

"(6) Would-be purchasers of new tires will be required to show to the local rationing boards that they fall within the

CALENDAR

Jan. 9.	Perkin Medal Award. New York, N. Y.
Jan. 9.	Quebec Rubber & Plastics Group.
Jan. 12-16.	S.A.E. Annual Meeting and Engineering Display. Book Cadillac Hotel. Detroit, Mich.
Jan. 30.	Akron Rubber Group. Akron City Club.
Feb. 3.	Los Angeles Rubber Group.
Feb. 4-6.	American Management Association Annual Personnel Conference. Hotel Stevens, Chicago, Ill.
Feb. 5.	Chicago Rubber Group.
Feb. 6.	Quebec Rubber & Plastics Group.
Mar. 2-5.	A.S.T.M. Committee Week and Spring Meeting. Cleveland, O.
Mar. 6.	Nichols Medal Award. New York, N. Y.
Mar. 23-25.	A.S.M.E. Spring Meeting. Houston, Tex.
Apr. 14-17.	1942 Packaging Exposition and Conference. Hotel Astor, New York, N. Y.
Apr. 20-24.	A. C. S. 103rd Meeting. Memphis, Tenn.

eligible groups, and that it is essential for them to get tires for the safe operation of their vehicles.

"(7) Purchasers fulfilling these requirements will be given certificates permitting them to make purchases.

"(8) Controls are also being developed over the sale of retreaded tires and the retreading of tires.

"(9) Appropriate price action to stabilize tire prices will be taken by the Office of Price Administration before the rationing plan is instituted.

"(10) The rationing plan will be issued as a priority order and will carry all the legal sanctions behind such orders, including the power to withhold priority assistance in replenishing stocks and criminal penalties incident to falsification of reports to the government."

Tire Rationing Plan[1]

The Office of Price Administration late last month issued classifications of vehicles for which new tires and tubes may be purchased on proper showings to local tire rationing boards under the rationing plan to go into effect January 5.

Eligibility Classification (List A)

LIST OF VEHICLES WHICH MAY BE EQUIPPED WITH NEW RUBBER TIRES, CASINGS, OR TUBES

No certificate shall be issued unless the applicant for the certificate certifies that the tire, casing or tube for which application is made is to be mounted:

(a) On a vehicle which is operated by a physician, surgeon, visiting nurse, or a veterinary, and which is used principally for professional services.

(b) On an ambulance.

(c) On a vehicle used exclusively for one or more of the following purposes:

1. To maintain fire fighting services;
2. To maintain necessary public police services;
3. To enforce such laws as relate specifically to the protection of public health and safety;
4. To maintain garbage disposal and other sanitation services;
5. To maintain mail services.

(d) On a vehicle, with a capacity of ten or more passengers, operated exclusively for one or more of the following purposes:

1. Transportation of passengers as part of the services rendered to the public by a regular transportation system;
2. Transportation of students and teachers to and from school;
3. Transportation of employes to or from any industrial or mining establishment or construction project, except when public transportation facilities are readily available.

(e) On a truck operated exclusively for one or more of the purposes stated in the preceding sections or for one or more of the following purposes:

1. Transportation of ice, and of fuel;
2. Transportation of material and equipment for the building and maintenance of public roads;
3. Transportation of material and equipment for the construction and maintenance of public utilities;
4. Transportation of material and equipment for the construction and maintenance of production facilities;
5. Transportation of material and equipment for the construction of defense housing facilities and military and naval establishments;
6. Transportation essential to render roofing, plumbing, heating and electrical repair services;
7. Transportation by any common carrier;
8. Transportation of waste and scrap materials;
9. Transportation of raw materials, semi-manufactured goods, and finished products, including farm products and foods, provided that no certificate shall be issued for a new tire, casing, or tube to be mounted on a truck used (a) for the transportation of commodities to the ultimate consumer for personal, family or household use; or (b) for transportation of materials for construction and maintenance except to the extent specifically provided by sub-sections 2, 3, 4, 5, and 6 of this section (e).

(f) On farm tractors or other farm implements, other than automobiles or trucks, for the operation of which rubber tires, casings or tubes are essential.

(g) On industrial, mining, and construction equipment, other than automobiles or trucks, for the operation of which rubber tires, casings, or tubes are essential.

Conditions Governing Sale of Tires

Details of the conditions governing the sale of tires to users on the "eligible" list also were announced by the OPA as follows and are incorporated in Supplementary Order No. M-15-c:

(1) That the vehicle on which the new rubber tire, casing, or tube is to be mounted is included in one of the categories enumerated in List A and thus constitutes an "eligible" vehicle.

(2) That the vehicle on which the new rubber tire, casing, or tube is to be mounted cannot be replaced by a vehicle owned or operated by or subject to the control of the applicant, which is equipped with serviceable tires and tubes and which is not fully employed for a use specified in one or more of the categories enumerated in List A.

(3) That the new rubber tire, casing, or tube is to be installed at once on a wheel or rim, to replace a tire, casing or tube no longer serviceable.

(4) That the tire, casing, or tube, when added to all other tires, casings, and tubes in the applicant's possession, whether unmounted or mounted on a vehicle, and when that total is applied only to eligible vehicles, does not add up to more than one spare tire, casing or tube of a given size for each eligible vehicle.

(5) That the existing tire, casing, or tube cannot be recapped, retreaded or repaired for safe use at speeds at which the applicant may reasonably be expected to operate, or that such recapping, retreading or repairing cannot be obtained without inordinate delay.

(6) That the applicant agrees to trade in replaced tires, casings, and tubes on new tires, casings, and tubes purchased under this order, or to dispose of replaced tires, casings, and tubes as may otherwise be directed by the Office of Price Administration.

The order also provides that any person who wilfully violates any provision, or falsifies records or information to be furnished pursuant to the order may be prohibited by the OPA from receiving further deliveries of any new rubber tires, casings, or tubes. Recommendations for prosecution under Section 35A of the Criminal Code and recommendations to the OPM that violators be prohibited from receiving further deliveries of any other material subject to allocation may also be made by the OPA.

The OPA also established, effective midnight January 4, 1942, maximum prices for new tires and tubes.

[1] Supplementary Order No. M-15-c to Restrict Transactions in New Rubber Tires, Casings, and Tubes, issued December 27, 1941, and Rationing Regulation No. 1 will be published in full in our next issue. EDITOR.

OPA Rulings

The Office of Price Administration, Washington, D. C., last month took action, as follows, on certain products relating to the rubber industry.

Reasonableness of increases ranging from 12 to 20% in the price for rubber camelback, used to retread worn automobile tires, is under investigation by the OPA and producers are being requested not to advance prices further pending completion of the study. In a letter to camelback manufacturers, Mr. Henderson pointed out the probability that tire retreading volume will expand substantially under the rubber conservation program; consequently, "public dependence upon camelback during the emergency will be very great."

"Since the supply of crude rubber available for camelback is already controlled by government allocation, price advances in excess of increases in allowable costs of production will not operate either to augment supplies or to accomplish any other justifiable purpose," Mr. Henderson stated.

Manufacturers are also requested to notify OPA in advance of any contemplated changes in camelback compound which might affect the quality of the finished product.

Because of the recent rapid increases in rubber footwear prices which the OPA is studying carefully, on December 4 it issued a letter to 27 manufacturers requesting them to refrain from advancing present prices of rubber footwear, which covers all types of rubber waterproof and canvas rubber-soled footwear, including sandals and specialty oxfords, but not leather or felt rubber-soled shoes. Manufacturers were also requested to give the OPA advance notice of any contemplated changes in their product which might alter its quality.

On December 5 leading dealers who sell scrap rubber to reclaiming plants were requested not to raise their prices above those charged on December 5 or the nearest prior date on which a sale was made.

The two principal American sellers of guayule rubber, The Intercontinental Rubber Co. and American Cyanamid & Chemical Corp., were asked December 16 by the OPA not to raise prices above those prevailing on December 6.

The OPA on December 19 requested manufacturers of rubber soles and heels to maintain current price levels and not to modify present discount schedules.

The OPA is surveying selling prices of machinery in various industries to prevent unwarranted price increases and is also holding meetings with various groups to discuss prices, costs, and other matters necessary to determine a level of maximum prices. The meeting with shoe machinery manufacturers was held December 10 in Washington. They previously had been requested not to increase prices of rentals on contracts for new equipment and repair parts while the study of their industry is being made.

In view of the current prohibition of new tire sales the Consumer Division of OPA is calling the attention of motorists to the possibilities of retreading old tires.

Price Schedule No. 56 Reclaimed Rubber[1]

The continuity of imports of crude rubber from the Far East is seriously threatened as a result of the outbreak of war with Japan. It has therefore become necessary to restrict consumption of crude rubber to the filling of military and essential civilian needs. This restriction upon the processing of crude rubber is expected to cause a marked increase in the use of all materials that serve as substitutes for crude rubber. The demand for reclaimed rubber, in particular, may be expected to expand sharply, thereby producing strong upward pressure upon its price. The Office of Price Administration has determined after investigation and after conference with members of the industry that an increase in prices above the present levels will not increase the supply of reclaimed rubber.

It is of vital importance to the nation's war effort that the process of substitution of reclaimed rubber for crude rubber should be facilitated in every possible manner by holding the cost of such substitution to a minimum. Consequently, the present emergency demands that maximum prices for reclaimed rubber be established.

Accordingly, under the authority vested in me by Executive Order No. 8734, it is hereby directed that:

1315.51 Maximum Prices for Reclaimed Rubber.

(a) On or after December 20, 1941, regardless of the terms of any contract of sale or purchase, or other commitment, no person shall sell, offer to sell, deliver or transfer, reclaimed rubber, and no person shall buy, offer to buy, or accept delivery of reclaimed rubber, at prices higher than the maximum price.

(b) 1. The maximum price shall be the highest price received by the seller for a sale during the period between November 5, 1941, and December 5, 1941, of reclaimed rubber of the same grade and quality, and of a comparable amount, to the same purchaser.

2. If no such sale to the same purchaser was made, the maximum price shall be the highest price received by the seller for a sale during such period, of reclaimed rubber of the same grade and quality, and of a comparable amount to a purchaser previously accorded similar treatment by the particular seller or recognized by the trade as entitled to similar treatment.

3. If, for any grade and quality of reclaimed rubber, no sale was made during the period between November 5, 1941, and December 5, 1941, either to the same purchaser or to a purchaser so entitled to similar treatment, the maximum price for that grade and quality shall be a price which bears the same relationship to prices actually received by the seller during such period for other grades and qualities, as the price of that particular grade and quality normally bears to prices of such other grades and qualities.[2]

1315.52 Less than Maximum Prices. Lower prices than those set forth in Section 1315.51 may be charged, demanded, paid or offered.[2]

1315.53 Evasion. The price limitations set forth in this Schedule shall not be evaded whether by direct or indirect methods in connection with a purchase, sale, delivery, or transfer of reclaimed rubber, alone or in conjunction with any other material, or by way of any commission, service, transportation, or other charge, or by tying-agreement or other trade understanding, or by making discounts or other terms and conditions of sale more onerous to the purchaser than those available or in effect on December 5, 1941, or by any other means.[2]

1315.54 Filing of Prices. On or before January 15, 1942, every person who sells reclaimed rubber shall file with the Office of Price Administration:

(a) Any printed price lists or quoted prices, including a complete statement of all terms and discounts, that were in effect during the period between November 5, 1941, and December 5, 1941.

(b) Prices which he received from each of his purchasers for each of his grades and qualities of reclaimed rubber on all sales made during the period between November 5, 1941, and December 5, 1941.[2]

1315.55 Records and Reports. Every person making sales or purchases of reclaimed rubber after December 20, 1941, shall keep for inspection by the Office of Price Administration for a period of not less than one year, complete and accurate records of (a) each such purchase of sale, showing the date thereof, the name and address of the buyer and the seller, the price paid or received, and the quantity of each grade and quality of reclaimed rubber purchased or sold, and (b) the quantity of each grade and quality of reclaimed rubber (1) on hand, and (2) on order, as of the close of each calendar month.

Persons affected by this Schedule shall submit such reports to the Office of Price Administration as it may from time to time require.[2]

1315.56. Affirmations of Compliance. On or before January 10, 1942, and on or before the 10th day of each month thereafter, every person, who, during the preceding calendar month has sold reclaimed rubber, whether for immediate or future delivery, shall submit to the Office of Price Administration an affirmation of compliance on Form 156:1, containing a sworn statement that during such month all such sales were made at prices in compliance with this Schedule or with any exception therefrom or modification thereof. Copies of Form 156:1 can be procured from the Office of Price Administration, or provided that no change is made in the style and content of the form and that it is reproduced on 8 x 10½" paper, they may be prepared by persons required to submit affirmations of compliance hereunder.[2]

1315.57 Enforcement. In the event of refusal or failure to abide by the price limitations, record requirements, or other provisions of this Schedule, or in the event of evasion or attempt to evade the price limitations, or other provisions of this Schedule, the Office of Price Administration will make every effort to assure (a) that the Congress and the public are fully informed thereof; (b) that the powers of Government both state and federal are fully exerted in order to protect the public interest and the interests of those persons who comply with the Schedule; (c) that full advantage will be taken of the cooperation of the various political subdivisions of state, county, and local governments by calling to the attention of the proper authorities failures to comply with this Schedule which may be regarded as grounds for the revocation of licenses and permits, and (d) that the Rubber Reserve Co. and the procurement services of the Government are requested to refrain from selling to or purchasing from those persons who fail to comply with this Schedule. Persons who have evidence of the offer, receipt, demand or payment of prices higher than the maximum prices, or of any evasion or effort to evade the provisions hereof are urged to communicate with the Office of Price Administration.[2]

1315.58 Modification of the Schedule. Persons complaining of hardship or inequity in the operation of this Schedule may apply to the Office of Price Administration for approval of any modification thereof or exception therefrom: Provided, That no application under this section will be considered unless filed by persons complying with this Schedule.[2]

1315.59 Definitions. When used in this Schedule, the term

(a) "person" means an individual, partnership, association, corporation or other business entity;

(b) "reclaimed rubber" means all kinds, grades and qualities of the rubber material recovered from any vulcanized scrap rubber products.

1315.60 Effective Date of the Schedule. The Schedule shall become effective on December 20, 1941.

Issued this 16th day of December, 1941.

LEON HENDERSON,
Administrator.

Local Tire Rationing Boards Set Up

Machinery for the organization of local tire rationing boards was set in motion December 19 with the departure to the field of ten OPA consultants who will handle this work in about half of the states. A meeting was held in Chicago, December 20, under Frank Bane, director of field operations for OPA with a second group of consultants who will direct formation of the local boards

[1] Title 32—National Defense, Chapter XI—Office of Price Administration, Part 1315—Rubber and Products and Materials of Which Rubber Is a Component.

[2] Sections 1315.51 to 1315.60, inclusive, issued pursuant to authority contained in Executive Orders Nos. 8734, 8875, 6 F.R. 1917, 4483.

in the balance of the forty-eight states.

The local boards are being established through state and local defense councils to handle applications of individuals and companies wishing to purchase new tires under the rationing plan scheduled to go into effect January 5.

The first group of men now in the field and the states in which they will arrange with state defense councils for creation of the local boards include:

Dudley Harmon, executive director, The New England Council will work in Massachusetts, Connecticut, Rhode Island, Maine, New Hampshire, and Vermont.

David W. Robinson, director, Interstate Commission on the Delaware River Basin, will work in Pennsylvania and Delaware.

Paul Morton, for many years city manager of Lexington, Ky., and Petersburg, Va., will work in Ohio and Michigan.

Alexander Harris, formerly director of public service, Knoxville, Tenn., and for many years vice president and general manager of the Tennessee Marble Co., will work in Alabama, Tennessee, and Kentucky.

L. L. Gravely, formerly mayor of Rocky Mount, N. C., state senator of North Carolina, vice president, Chinese-American Tobacco Co., and for some time general consultant in the southern states for the National Defense Advisory Commission, will work in North Carolina, South Carolina, Georgia and Florida.

W. T. Ellis, assistant director of the budget, State of Virginia, and assistant director of the Virginia State Council of Defense, will work in Virginia, West Virginia, and Maryland.

James J. Harrison, chairman of the Arkansas State Planning Board and chairman of the State Council of Defense in Arkansas, will work in Arkansas, Louisiana, and Mississippi.

Formation of local committees in New York and New Jersey will be under the direction of Sylvan Joseph, New York regional director, OPA.

The Forty-sixth Congress of American Industry, National Association of Manufacturers, convened December 3, 4, and 5, 1941, at the Waldorf Astoria Hotel, New York, N. Y. After the luncheon session, December 4, Harvey S. Firestone, Jr., president of the Firestone Tire & Rubber Co., participated in a broadcast interview with Edwin C. Hill and Lammot du Pont on "Jobs after Defense." Mr. Firestone said that such restrictions as price control, priorities, and allocation of materials must be discontinued after the war to restore the competitive system which is the only permanent method of insuring lower prices, greater volume and more jobs. Among seven women in defense work honored by the convention, was Chloe De Long, of Akron, a sculptress who designs new tire models in clay for Firestone.

OPM Cuts Civilian Rubber Production to 20%

The Office of Production Management, Washington, D. C., on December 11 under Supplementary Order No. M-15-b to Restrict the Use of Rubber and (December 19) Amendment No. 1 to the order (see pages 376-378) decreed a reduction in civilian rubber output to the barest essentials at the November, 1941, rate, of: camelback, certain mechanical goods, health supplies, certain footwear requirements, protective clothing, food industry needs, wire and cable insulation, tire and tube repair materials, certain types of cement, and babies' nipples. There is no limitation on the manufacture of truck and bus tires and tubes over seven inches in diameter.

New Rubber Products Branch Chief

Willard Helburn, of Cambridge, Mass., was appointed chief of the Rubber and Rubber Products Branch of the Division of Civilian Supply, December 5, according to Joseph L. Weiner, deputy director. Mr. Helburn succeeds Barton Murray, resigned.

Mr. Helburn is president of Willard Helburn, Inc., a leather manufacturing company, of Peabody, Mass. He was graduated from Harvard University in 1904. After two years as a newspaperman, he entered the leather business headed by his father and has been connected with it approximately 35 years. He was loaned to the government in August to organize a hide and leather products section of the old Office of Price Administration and Civilian Supply. Since the Division of Civilian Supply became a part of OPM, he has been serving as a civilian allocation specialist assigned to the Textiles, Clothing and Equipage Branch of the Division of Purchases.

Labor Program

Sidney Hillman, associate director general, OPM December 18 released a five-point program for the rubber industry for labor and management to follow in handling labor problems resulting from the war curtailed civilian output. Based upon the statement of policy from OPM September 17, 1941, the program includes provision for the protection of seniority rights; transfer of employes, from non-war to war jobs within plants; preferential hiring of displaced workers; recall of workers by original employer for war tasks; and retention of seniority by workers in training for defense jobs.

As the government's discussions with labor and management also indicated the importance of converting civilian rubber factories to war production, the Contract Distribution Division of OPM is collaborating with Labor Division and industry officials on methods for so doing.

Arrangements are also being made for close cooperation of rubber workers unions, managements, and the state employment services for group registration of all displaced or laid-off workers to expedite their employment in war industries and retraining for war production.

The conferences leading up to this program were held in Akron, O., December 11 and 17, 1941, under the chairmanship of Eric Nicol, associate chief, labor supply branch, Labor Division, and participated in by representatives of the leading rubber manufacturers and labor unions, including: S. H. Dalrymple, L. S. Buckmaster, Frank Grillo, George R. Bass, George Cummins, C. V. Wheeler, C. F. Richmond, Gerald T. Palmer, E. L. Templeton, Howard Hass, and Rex C. Murray, all of the United Rubber Workers of America; John J. Murphy, of the AFL Rubber Workers; I. B. Calvin, Seiberling Rubber Co.; John A. Christie, Mohawk Rubber Co.; W. R. Murphy, Firestone Tire & Rubber Co.; H. B. Spencer, United States Rubber Co.; H. L. Barnes, General Tire & Rubber Co.; D. D. Reichow, B. F. Goodrich Co.; Fred W. Climer, Goodyear Tire & Rubber Co.; and H. W. Croysdale, Republic Rubber Division, Lee Rubber & Tire Corp.

Waste Conservation Program

Maryland, according to an announcement December 2, was chosen by the OPM Bureau of Industrial Conservation for the launching of its program to increase the salvaging of waste paper, rags, scrap metal, and rubber. Similar programs are planned eventually for the other states.

Lessing J. Rosenwald, chief, Bureau of Industrial Conservation, on December 14 urged every American to join a "Salvage for Victory Campaign" and begin immediately to save for war production all waste paper, rags, metal, and old rubber. The Bureau advises all that scrap metals, paper of all kinds, rags, old tires and inner tubes be sold to local collectors or be given to collecting charities.

New Branches

Two new industrial branches were recently formed in the Division of Purchases as a result of splitting the health supplies and fire equipment branch. The new health supplies branch will have jurisdiction over drugs, medicines, surgical supplies, dental supplies, hospital supplies, toilet goods, and cosmetics. The chief of this branch is William M. Bristol, Jr., assistant director of purchases. The other new branch, safety and technical equipment, will cover all motorized fire equipment, fire extinguishers, fire hose, and fire-hose couplings, sprinkler systems, and a variety of safety and technical equipment. Chief of this branch is Oakley W. Dexter, who recently assumed his new duties with the title of assistant director of purchases.

An Inventory and Requisitioning Section was set up December 9 in the Priorities Division, OPM, to provide for

prompt acquisition of war materials whenever normal sources of supply are inadequate. The requisitioning procedure will not be used to interfere with control over the flow of materials to war and essential civilian industries by the priorities system, but will supplement the system whenever priority orders are insufficient to get essential materials to the right place at the right time. E. A. Tupper will act as chief of the Section, under the general supervision of L. J. Martin, chief of the Compliance and Field Service Branch.

The OPM on November 4 changed the name of the Bureau of Clearance of Defense Industry Advisory Committees to Bureau of Industry Advisory Committees.

Rulings on Motor Vehicle Output

A further slash of 25% for December production and 50% for January production below previously established quotas for passenger cars was ordered December 11 by the Division of Civilian Supply, OPM. The order effects a decrease of 51,212 cars from the December quota of 204,848 cars, and a reduction of 102,424 for January. Light truck production was ordered cut from the previously set figure for December and January of 24,169 units for each month to 18,127 units and 12,085, respectively. February automobile quotas announced on November 19 were revoked pending further study, and drastic cuts are predicted for February and March.

An order dated December 4, 1941, states that manufacturers of medium motor trucks (between 1½ and three tons) shall not now make more than 50% of the number of such trucks they produced during the first half of 1941.

All restrictions on production of heavy truck trailers were ordered removed December 4, 1941, by the OPM. The exemption was made because both in metals consumed and cost, trailers provide the most economical form of commercial highway transportation. Limitation Order L-1-a formerly limited production of truck trailers of five tons or more to two-thirds the output during the first six months of 1941.

Other Announcements

The Production Requirements Plan, a method of expediting priority assistance to manufacturers in essential production, explained here in detail last month, was formally announced by the OPM December 3.

The OPM last month issued an order prohibiting the sale, shipment, or delivery by producers or any other person of new passenger automobiles equipped with more than four tires.

January and February production of domestic mechanical refrigerators was ordered cut from 30 to 52% below the monthly average output for the 12 months ending June 30, 1941, with the larger companies bearing the greater reductions.

Large manufacturers of household vacuum cleaners were ordered to reduce production during the last quarter of 1941 by 10%, based on average monthly factory sales for the year ended June 30, 1941.

A new order which helps many thousands of manufacturers and producing plants to obtain repair, maintenance, and operating supplies was announced December 18 by the Division of Priorities and is known as Preference Rating Order P-100. It takes the place of the old Repair and Maintenance Order, P-22, which is being revoked. Main purpose of the new order, as was the case with the old, is to extend priority assistance to manufacturers and producers so that they can keep their plants and production machinery in good running order. This is in accordance with the policy set by the Supply Priorities and Allocations Board. The differences between P-100 and P-22 are largely technical.

On December 19 an order was issued to golf ball manufacturers freezing their stocks and prohibiting further shipment and manufacture of golf balls.

The OPM on December 23 completely revised Priorities Regulation No. 1 to require producers to accept all orders bearing a priority rating before taking any unrated business. Thus producers must accept B-rated orders for essential civilian use, as well as A-orders, bringing essential civilian industries under the scope of the priorities system.

An order was announced November 24 prohibiting, after March 15, 1942, the use of lead and tin foil as packaging for a number of goods including friction tape. Soon after, however, the order was suspended for 30 days. An announcement late in December stated the order would be held in abeyance a few days more. In view of the cessation of tin imports more drastic regulations are expected.

The OPM last month discouraged the use of surgical tape in air raid precautions, for surgical adhesive tape contains three materials needed for defense: rubber, zinc, and cloth. Recommended, instead, for application to windows were ordinary gum, industrial, or scotch tape.

On December 11, Leon Henderson, director, Civilian Supply Division, urged every American citizen to cooperate in the conservation of rubber. Then on December 13 he warned that any tire dealer who evaded the temporary ban on new tire and tube sales would be unable to replenish his stocks under the tire rationing system.

In a further effort to conserve rubber the OPM on December 15 requested the nation's 27,000,000 motorists to hold pleasure driving to a minimum, to use street cars and buses when possible, to carry small packages instead of having stores make deliveries, and to have neighbors pool their cars using only one to go to work instead of several. For longer use of existing tires the OPM recommends: retreading, proper inflation, careful driving, at normal speeds, avoiding all obstructions, prompt repairs, checking wheel alinement, changing wheel positions every 5,000 miles, and proper size of tires.

Personnel Appointments

Alden C. Brett, secretary-treasurer, Hood Rubber Co., Inc., Watertown, Mass., has been appointed chief of the Contracts Clearance Branch, Division of Purchases, OPM.

Charles L. Sheldon, Hood purchasing agent, has been assigned to the containers branch, Division of Purchases.

Ernest F. Pierson, of American Steel & Wire Co., Cleveland, O., has been named to the equipment and supply procurement branch, Division of Purchases, as a purchasing consultant on wire and cable.

James W. Proctor, of Wellington Sears Co., New York, N. Y., has been appointed to the textile branch, Division of Purchases, as consultant on cotton duck.

William M. Rand, vice president in charge of production, Monsanto Chemical Co., St. Louis, Mo., has been named production adviser to the chief of the Chemical Warfare Service.

Supply Contracts Awarded

The War Department, Washington, D. C., recently awarded supply contracts as follows: *abrasive wheels,* Allison Co., $1,100; *aniline oil,* Monsanto Chemical Co., $56,250; *bags, inner tube,* Kellogg Corset Co., $3,465; *bags, Pliofilm,* Milprint, Inc., $43,647.50, Shellmar Products Co., $43,647.50; *balloons,* Air Cruisers, Inc., $16,800; *batteries, etc.,* Electric Storage Battery Co., $1,006,415.60; *bearings,* Timken Roller Bearing Co., $15,564.84; *belts,* Russell Mfg. Co., $53,400; *brushes,* Pittsburgh Plate Glass Co., $7,015.68; *cable, wire, and reels,* American Steel & Wire Co. of N. J., $51,760.50, Anaconda Wire & Cable Co., $1,020,200.80, Circle Wire & Cable Co., $15,540.50, General Cable Corp., $2,456,095.63, General Electric Co., $535.50, Okonite Co., $454.50, Phelps Dodge Copper Products Co., $618, John A. Roebling Sons Co., $2,020, Simplex Wire & Cable Co., $19,147.90, United States Rubber Co., $279,000, Whitney Blake Co., $231,000; *canisters and gas masks,* Firestone Tire & Rubber Co., $382,962.86; *casings and tubes,* Goodyear Tire & Rubber Co., $1,146,188.51, U. S. Rubber, $223,413.80; *chemicals,* American Cyanamid & Chemical Corp., $647,600, E. I. du Pont de Nemours & Co., Inc., $741,666.64; *cloth,* Coated Products Corp., $118,437.50, Stedfast Rubber Co., $106,875, Vulcan Proofing Co., Inc., $301,590; *compass assemblies,* Taylor Instrument Cos., $48,298; *cordage,* Diamond Wire & Cable Co., $16,345.50, National Electric Products Corp., $5,380; *couplings,* Essex Rubber Co., $1,178; *covering inserts,* B. F. Goodrich Co., $68,610; *disks, valve,* Goodrich, $2,153.40; *duck,* Mt. Vernon Woodberry Mills, Inc., $749,212.50, Turner Halsey Co., $304,625, U. S. Rubber, $79,500; *faceblanks,* Acushnet Process Co., $178,250, Firestone, $178,250, General Tire & Rubber Co., $239,250, Goodyear Tire, $239,250; *footwear,* Converse Rubber Co., $127,051.60, Goodrich, $166,942.80, Goodyear Footwear Corp., $78,616.80, Goodyear Rubber Co., $119,-

165.70, Hood Rubber Co., $316,651.87, LaCrosse Rubber Mills, $55,956.80, Servus Rubber Co., $68,645.41, Tyer Rubber Co., $68,044, U. S. Rubber, $401,376.80; *forgings,* United Shoe Machinery Corp., $5,509; *fuse bodies,* Boston Woven Hose & Rubber Co., $49,200; *gaskets,* Toledo Industrial Rubber Co., $2,064; *gasoline and oil,* Socony-Vacuum Oil Co., Inc., $52,318; *gloves,* Miller Rubber Co., Inc., $3,096.60; *grinding wheels,* Bay State Abrasive Products Co., $1,111.88, Carborundum Co., $1,295.64, Norton Co., $46,792.80; *hose, etc.,* Goodall Rubber Co., Inc., $9,475.86, Goodrich, $59,093.54, U. S. Rubber, $5,399.16; *hosetubes,* Acushnet, $85,470, Firestone, $57,387.33, U. S. Rubber, $115,137.33; *links, belt,* Firestone, $2,002,000; *nozzles, inner tube,* Revere Copper & Brass, Inc., $54,043.20; *oil retainers,* Garlock Packing Co., $2,204.54; *plaster, adhesive,* Gotham Aseptic Laboratory Co., Inc., $5,134.50, Johnson & Johnson, $79,973.89, Kendall Co., $42,239.61, Parke, Davis & Co., $26,059.32, Seamless Rubber Co., $16,058.08; *ponton spacers,* General Tire, $4,025; *presses,* West Tire Setter Co., $367,850; *pumps,* Baldwin Locomotive Works, $13,475; *rafts,* Air Cruisers, $392,040, Goodyear Tire, $798,293.75; *raincoats,* Archer Rubber Co., $239,528, Cable Raincoat Co., $505,687.03, Cambridge Rubber Co., $88,737, Chicago Rubber Clothing Co., $41,667.42, Sigmund Eisner Co., $214,912.49, Hodgman Rubber Co., $36,763.20, Interstate Mfg. Co., $36,616, Kay Sportswear Co., $398,600, King Kard Overall Co., $169,101.63, Marathon Rubber Products Co., $484,440, Monarch Coat Co., Inc., $160,930, U. S. Rubber, $77,280, A. B. Zickert Co., $54,924; *repair parts,* Firestone, $18,100.18; *reports, testing and engineering,* U. S. Rubber, $7,500; *reflectors,* Firestone Rubber & Latex Products Co., $8,111.79; *scales,* Exact Weight Scale Co., $23,328; *socks,* Mishawaka Rubber & Woolen Co., $622.20; *solder,* National Lead Co., $4,979.53; *tape,* Arno Adhesive Tapes, Inc., $12,703.50, Kendall, $9,750.72, Mica Insulator Co., $595; *tape rolls,* Firestone, $1,558.70; *test machines,* Baldwin, $18,810; *tires and tubes,* Firestone, $171,199.57, Goodrich, $1,526.76, U. S. Rubber, $8,388; *truck parts,* Firestone, $18,892.39; *tubs, foot,* American Hard Rubber Co., $1,210.72; *valves,* Goodrich, $12,500, Lower Rubber Mfg. Co., $79,125.12, O'Sullivan Rubber Co., $73,500, Rubber Corp. of America, $57,566.75; *webbing,* Everlastik, Inc., $56,210.50, Russell, $46,568, United Elastic Corp., $139,888.60, J. W. Wood Elastic Webbing Co., $1,955; *wipers and molds,* Garlock, $1,849.90; *zinc dust,* New Jersey Zinc Sales, Inc., $7,280.

Consumer Prices, official publication of the Office of Price Administration, for October 20, 1941, contains an article "Don't Bury Your Tires Alive", which reports that the Army Quartermaster Corps working with a convoy of trucks on a 9,000-mile test run found that recapping or retreading a used tire will extend its life by 80% at less than half the original cost of the tire.

Synthetic Rubber Output to Be Upped 200%

H. J. Klossner, president of Rubber Reserve Co., an RFC subsidiary, and Jesse Jones, Secretary of Commerce and Federal Loan Administrator, December 15 met with representatives of Firestone, Goodrich, Goodyear, and U. S. Rubber to discuss the advisability to meet wartime needs of increasing the capacity of synthetic rubber plants now under construction.

Then on December 24 the Supply Priorities and Allocation Board approved Mr. Jones' proposal to triple the present program of synthetic rubber production subject to the approval of the Priorities Division, OPM, that sufficient materials would be available for the construction and the operation of the extra plants required. The SPAB has directed the Priorities Division to start immediately working out with the RFC the necessary tabulations of materials needed for this new program.

Synthetic rubber plants now being built call for an annual capacity of 40,000 tons. Mr. Jones believes that if his plan becomes effective immediately the new plants, to raise annual output to 120,000 tons, could begin operations early next year.

Tire Exports Banned

The Economic Defense Board, Office of Export Control, on December 11, 1941, advised collectors of customs at all ports of entry not to clear, until further notice, the exportation of rubber tires or tubes of any kind, crude rubber, or crepe rubber. These commodities may not be shipped to any destination whatever, unless consigned to the military or naval forces of the United States Government, or the shipment is to be made under provisions of the Lend-Lease Act.

Customs collectors were warned that this prohibition must be considered effective immediately. It applies to all shipments of the character referred to whether or not laden aboard the exporting carrier, whether or not a license authorizing such exportation has been issued, and regardless of any other circumstance which may be involved.

The prohibition of such exportations does not apply to tires which are being exported as component parts of either new or used vehicles.

A later order exempted from the above provisions all *used* tires and tubes, provided the export licenses, where necessary, are presented to collectors of customs, and all tires and tubes consigned to The Panama Canal, the official designation of the authority operating the Canal.

For More Guayule

A bill by Senator Sheridan Downey of California was introduced on December 22, with the approval of the Military Affairs Committee, calls for the Department of Agriculture to provide for planting 45,000 acres of guayule shrubs. The Reconstruction Finance Corp. would finance the venture.

Under the plan approved December 17 by Paul H. Appleby, Under-Secretary of Agriculture, in the fifth year a yield of 37,125 short tons could be expected from the 45,000 acres, on the basis of 1,650 pounds per acre.

Wm. O'Neil, president, General Tire & Rubber Co., Akron, O., for some time now has been agitating among government officials for legislation subsidizing the development of guayule to augment our rubber supply. He suggests the immediate establishment of pilot areas in California, New Mexico, Arizona, and Texas and also a survey of Latin American countries to determine how much wild guayule is available. Besides all available seed in the Salinas Valley, Calif., should be planted, according to Mr. O'Neil.

The United States Department of Agriculture, Washington, D. C. on December 15 announced that despite the war in the Pacific the program to re-establish rubber production in the Western Hemisphere will proceed on schedule. Recently a final shipment of 5,500 budded trees from the Philippines reached American shores safely.

National Bureau of Standards, Division of Simplified Practice, on December 17 held a meeting in Washington, D. C., to consider the further simplification of copper conductors for building purposes. Manufacturers and representative distributers were invited to attend.

Governor Lehman of the State of New York on December 19 as part of the State Defense Council named a state advisory committee on conservation of waste materials to conduct a continuous salvage program for waste materials needed for war effort, including rubber.

PACIFIC COAST

The motion picture industry during a year utilizes rubber goods valued at nearly $75,000, including fire hose, sponge rubber, ordinary hose and tubing, latex, matting, and rubber cement. One firm spent about $10,000 on a specialty, a mechanical octopus largely of latex.

Western Insulated Wire, Inc., 1001 E. 62nd St., Los Angeles, Calif., according to Vice President E. H. Lewis, recently made a second installation of braiding equipment to increase capacity about 50%.

EASTERN AND SOUTHERN

Schwartz with Moore & Munger

Emil W. Schwartz joined the technical service sales organization of Moore & Munger, New York, N. Y., November 1. His new duties will include technical service and promotion sales work on Synthetic 100, Catalpo, and Paraforce, which Moore & Munger has been supplying the trade for many years. Mr. Schwartz was in charge of the works laboratory at the Bridgeport, Conn., plant of General Electric Co. since 1924. In 1934 he received the Charles A. Coffin Foundation Award from GE for his work in rubber and synthetics.

He is a graduate of Yale University and a member of the Rubber Division, A. C. S.; the New York Group, serving on its executive committee several terms; and the ASTM Committee D-11 on Rubber Products.

R. M. Neumann, general sales manager of The New Jersey Zinc Co., 160 Front St., New York, N. Y., on December 18 celebrated his thirty-fifth anniversary with the company which he had joined in 1906 as a clerk in the treasury department. By 1912 he had become cashier and before the year-end was made assistant treasurer and secretary of the Mineral Point Zinc Co., a subsidiary. He was then transferred to Chicago, where, in 1918, he was appointed manager of western sales for the parent organization. In 1935, Mr. Neumann returned to New York as manager of the New Jersey Zinc pigpigment division. He was named to his present post in 1939.

Hewitt Rubber Corp., 240 Kensington Ave., Buffalo, N. Y., on December 5 formally dedicated its recently completed factory office and service building, part of its plant expansion program costing more than a half million dollars in new buildings and equipment. President Thomas Robins, Jr., was the principal speaker, and at the close of the ceremonies he and Earle K. Twombly, vice president and treasurer, read the names of those employes being presented with service pins marking ten or more years with the company.

Jos. Stokes Rubber Co., Trenton, N. J., is operating to full capacity with many orders on hand. The Canadian plant at Welland, Ont., is running six days a week.

Willard Pratt Smith, secretary-treasurer of Intercontinental Rubber Co., 745 Fifth Ave., New York, N. Y., and of its subsidiaries, Continental Rubber Co. of New York and Continental-Mexican Rubber Co., retired December 31 after 35 years of service. He has been succeeded as secretary by Henry G. Atwater, who will continue also as a vice president. The new treasurer is J. H. Linxweiler, who is also sales manager.

Barrett Co. Now Barrett Division

The Barrett Co., 40 Rector St., New York, N. Y., was consolidated on December 1, 1941, with its parent company, Allied Chemical & Dye Corp. Operations are conducted under the new firm name The Barrett Division, Allied Chemical & Dye Corp., but there has been no change in personnel, according to L. G. Lawrance, director of materials control.

Pittsburgh Plate Glass Co., Grant Bldg., Pittsburgh, Pa., through President R. L. Clause has announced the appointment, effective January 1, of Stuart M. Campbell, of Chicago, as comptroller to succeed M. C. Spahr who retired after 50 years with the company.

A. Schrader's Son, 470 Vanderbilt Ave., Brooklyn, N. Y., is distributing gratis to service stations and garages a red-white-and-blue, 20- by 13-inch poster, "Conserve Rubber for National Defense", which gives several hints to the motorist on the care of tires to save rubber and also gas.

Warner Bros. Co., Inc., 200 Madison Ave., New York, N. Y., last month at the Waldorf-Astoria Hotel, held its spring showing of corsets; while about thirty other manufacturers displayed at the McAlpin and Vanderbilt hotels. Prices are higher, over last spring, but styles were fewer. Nylon was the featured material, and supplies of lastex in the hands of manufacturers were reported sufficient for the time being. But for later on the materials situation seems uncertain.

American Hard Rubber Co., Butler, N. J., according to President E. H. Boyer, for the first 44 weeks of 1941 experienced a 53% gain in sales volume over the preceding year.

Felix L. Yerzley, for more than five years physicist of the Rubber Chemicals Division, E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., is now with the engineering department of the Pioneer Instrument Division, Bendix Aviation Corp., Bendix, N. J.

The City of Trenton, N. J., has acquired by tax delinquency the premises of the old Empire Rubber and Murray Rubber companies. The amount due to Trenton for taxes amounted to $84,000. The buildings of both companies are leased to different concerns.

J. T. Baker Chemical Co., Phillipsburg, N. J., has announced that the Vick Chemical Co. has acquired control of its common stock. But, according to J. S. McAbee, division sales manager, the Baker company will remain essentially the same as far as name and management are concerned.

U. S. Rubber News

F. B. Davis, Jr., president of the United States Rubber Co., 1230 Sixth Ave., New York, N. Y., in urging strict and cheerful cooperation with the government's decree restricting tire sales, urged motorists to have tires retreaded if the carcass is good; if retreading is not possible, used or retreaded tires should be purchased.

Naugatuck Aromatics Division of U. S. Rubber on December 20 moved from 12 E. 22nd St. to 254 Fourth Ave., New York.

About 98 veteran employes, men and women, of the Gillette Tire plant of U. S. Rubber at Eau Claire, Wis., at a banquet on November 14 organized a "20-Year Club", the first such group in the vast U. S. Rubber organization. Officers were elected, and pins presented.

The Rubber Manufacturers Association of New Jersey held its annual meeting December 9 at the Trenton Country Club, Trenton, N. J., when the following officers were reelected: George T. Gretton, Home Rubber Co., president; Herbert South, Home Rubber, vice president; J. Edward Myers, Acme Rubber Mfg. Co., secretary; and Horace B. Tobin, treasurer.

American Petroleum Institute, 50 W. 50th St., New York, N. Y., has named several committees for 1942. Among the personnel are: J. A. Brown, of Socony-Vacuum Oil Co., Inc., W. S. Farish, Standard Oil Co. (New Jersey), J. H. Pew, Sun Oil Co., and W. G. Skelly, Skelly Oil Co., all on the committee of reorganization of the functions and structure of the Institute; and H. M. Stalcup and R. P. Roark, both of Skelly, and D. S. Sykes, of National Lead Co., on the committee for the mid-continent district meeting.

The Thermoid Co., Trenton, N. J., has elected as vice presidents C. A. Klaus, director of automotive replacement sales, and Carl A. Schall, chief sales and development engineer.

William Henry Sayen, 3d, and Miss Hannita B. Janney, were married recently. Mr. Sayen, son of William Henry Sayen, president of the Mercer Rubber Co., Hamilton Square, N. J., is a traveling salesman for the firm.

J. Waldron Reed, in charge of the Houston, Texas, branch of the Mercer company, with Mrs. Reed is visiting Trenton and other northern cities.

Titeflex Metal Hose Co., Newark, N. J., has let a contract for altering a three-story factory building for the manufacturing of radio equipment for the Navy Department. The work will cost $50,000.

Nearpara Rubber Co., Trenton, N. J., reports being unable to fill all the orders on hand for reclaimed rubber. The plant is operating night and day.

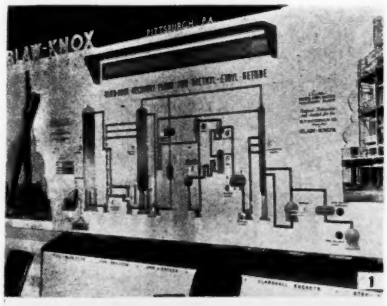
18th Exposition of Chemical Industries Attracts Largest Crowd in Ten Years

The Eighteenth Exposition of Chemical Industries at Grand Central Palace, New York, N. Y., December 1 to 6, 1941, drew an attendance of more than 40,000 persons to the 335 exhibits that occupied three floors of the building. M. C. Whitaker, vice president of the American Cyanamid Corp., chairman of the show, announced at its conclusion that the attendance was the largest in ten years. Graphic and informative displays detailed the advance of chemical technology in many fields. Novel materials and numerous innovations in equipment design and processing were demonstrated at many booths. Machines redesigned to effect economy in expensive, scarce, or controlled materials, and to utilize new chemical raw materials gave evidence of recent intensive study and research.

Much of the machinery exhibited was of interest to the rubber industry and included mixing equipment, centrifuges, plastic molding presses, and colloid and ball mills. Supplementary equipment included precision instruments, weighing apparatus, materials handling and packaging equipment, driers, and safety devices.

Keyed to the theme "Chemistry in Strategic Materials", the American Chemical Society exhibit displayed, among various materials, samples of synthetic rubbers and products made from them, including butyl rubber balloon cloth and acid hose; Buna S gas mask tubing, washers, diaphragms, and gaskets; Perbunan cable terminals, deck matting, and lining for chemical tanks; Hycar barrage balloon cloth, gasoline hose nozzles, sink strainers, and hard rubber; Ameripol refrigerator gaskets, oil hose, sponge rubber, and oil seals for aircraft hydraulic systems; "Thiokol" gloves, soldier and civilian gasproof clothing, auto spray paint hose, warship ignition cables, tank gaskets; polybutene (Vistanex and Synthetic 100) grease seals and bushings, aircraft seals and diaphragms; and neoprene samples.

Among the Exhibitors at the Exposition of Chemical Industries were: (1) Blaw-Knox Co., (2) The American Chemical Society, Which Displayed Synthetic Rubber Products, (3) Mixing Equipment Co., Inc., (4) Exact Weight Scale Co., (5) Luzerne Rubber Co., (6) Barco Mfg. Co., (7) Cambridge Instrument Co., Inc., (8) Willson Products, Inc., (9) United States Stoneware Co., (10) Neville Co., (11) American Hard Rubber Co.



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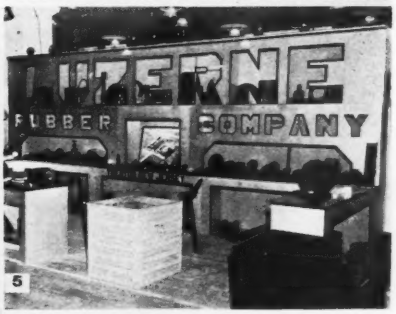

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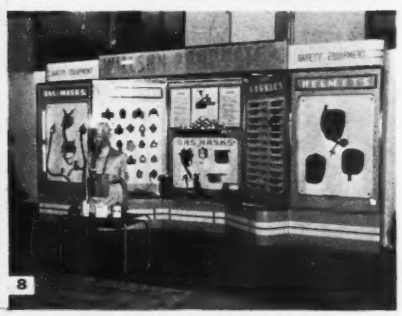

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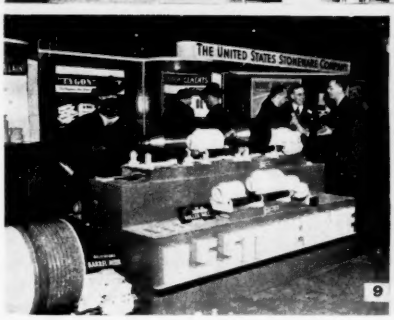

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All Photos Taken by INDIA RUBBER WORLD *Staff Photographer*

The Blaw-Knox Division of the Blaw-Knox Co. featured an illuminated chart diagramming the flow of materials in the recovery of methyl-ethyl-ketone in The B. F. Goodrich plant. A moving tape above the chart described the essentials of the recovery process of this solvent for koroseal.

The Brabender Corp. exhibited a plastograph for recording consistency in metric units; a viscosimeter which heats test material at a constant rate and automatically plots a curve recording time, temperature, and viscosity simultaneously; a semi-automatic moisture tester; and a viscograph. A combination surface, needle, and mold pyrometer, and a fabric permeameter currently much used for testing balloon and parachute cloth were displayed by the Cambridge Instrument Co., Inc.

The Mixing Equipment Co., Inc., showed its line of "Lightnin" electric mixers and a new propeller type with an air-driven motor. Revolving-type flexible ball joints improved for a wider range of temperature were exhibited by the Barco Mfg. Co. The Downington Mfg. Co. made the first exposition showing of an unusual type of "sqeegee" pump actuated by alternately compressing and expanding a rubber tube.

Defense uses for Parlon, a chlorinated rubber, were graphically highlighted by the Hercules Powder Co. The Neville Co. displayed three new emulsions of Nypene, a terpene polymer, which are reported to extend and tackify latex. A straight-chain type of synthetic wax to replace carnauba wax, that may prove applicable to rubber compounding, was shown by Foster D. Snell, Inc. The American Resinous Products Corp. exhibited, among several new resins, Alkyd 17-C, a permanently tacky emulsion to extend latex, and Alkyd 18, a non-tacky emulsion which combines with latex for impregnation processing where stiffness, tensile strength, and aging resistance are required. In a large assortment of Dicalite products were four rubber fillers. United States Stoneware Co. displayed samples of Neoseal, a rubber resin which comes in calendered sheets, and Amron, a vinyl acetate-chloride copolymer, available in calendered sheets, press polished sheets, and flexible or rigid extruded shapes.

Protective Coatings, Inc., showed its line of seamless rubber and seamless sheet rubber linings as well as other supplementary products. The feature display of Willson Products, Inc., was industrial gas masks in which rubber and plastics have been substituted in parts formerly made of aluminum and other metals. Other companies showing rubber products included: Mine Safety Appliance Co.—protective clothing and industrial masks; Pioneer Rubber Co.—odorless neoprene industrial gloves; John A. Roebling's Sons Co.—rubber insulated cables; Garlock Packing Co.—molded products and tubing; American Hard Rubber Co.—a protected chlorine gas cooler, a molded vinegar dumper, and a 32-inch filter press plate. The Luzerne Rubber Co. displayed rubber covered fans for handling acid fumes, and machine parts in which hard rubber was substituted for aluminum.

Rubber & Plastics Compound Co., Inc., has leased space in the RCA Building, Rockefeller Center, New York, N. Y. The firm, organized a year ago to study and develop new rubber reclaiming processes, has an experimental laboratory in downtown New York. The company will exploit "Nervastral" reclaiming processes and will grant licenses for their use and also give such help and assistance as may be required by interested factories. Angiolo Treves is general manager of the concern. His associates are Henri and Oscar Ghez, reclaiming experts from abroad.

Martindell Molding Co., Ewing Township, Trenton, N. J., has increased its working staff and added Saturday to its working hours. The company's principal output is for defense work.

Jungmann & Co., Inc., importer, exporter, and distributer of industrial and fine chemicals and raw materials, on December 19 moved from 157 Chambers St. to 74 Trinity Place, New York, N. Y.

New York University, Division of General Education, Washington Square, New York, N. Y., is now giving a series of lectures which includes one at 8:00 p.m., January 20 on Rubber and Synthetic Rubbers. Tickets are $1.50 and may be purchased in Room 211, 100 Washington Square East.

I. B. Kleinert Rubber Co., 485 Fifth Ave., New York, N. Y., honored DeWitt Overbaugh with a testimonial dinner December 16 in acknowledgment of his 50 years' service with the firm. Mr. Overbaugh, the seventh Kleinert employe to receive such recognition, was presented with a gold watch by Harry Kleinert, vice president of the company, and Ralph K. Guinzburg, president, spoke briefly.

At the annual meeting of the Kleinert sales staff last month President Guinzburg delivered the key address which treated of company plans for 1942 and the effect of the war on general business conditions.

"I'm a Waste Warden, saving for family and for defense" is the theme of an advertising and promotion plan geared to the American conservation program, announced by Kleinert for the spring.

MIDWEST

Thirty-four rubber firms in the Midwest recently paid 18,472 employes $574,000 in wages, declines of 1.9% and 0.7%, respectively, from the previous month.

Ford Experiments Result in New Source of Rubber

In consequence of the pioneering of the Ford Motor Co., Dearborn, Mich., on its rubber plantations in the Brazilian jungle, plans are being evolved to make the United States independent of the Far East for its raw rubber. Experts of the United States Department of Agriculture and American rubber companies have visited the Ford plantations to study the methods developed there during 14 years at a cost of $20,000,000. Using buddings of high-yielding clones supplied by the Ford plantations, these experts are establishing experimental plantations in countries around the Caribbean Sea.

The Ford plantations, where 3,651,500 rubber trees have been planted, are now in production on a limited scale. In 1942 they will ship about 750 tons of creamed latex to Dearborn. By 1950 it is estimated annual production will be 7,500 tons, but the eventual goal is 38,000 tons, Ford's approximate annual rubber requirement.

Present production, of course, is only a small fraction of the nation's needs, but Ford and the Department of Agriculture experts believe that in time rubber production in the Western Hemisphere can supply all the requirements of this country.

The Ford experts have perfected types of rubber trees that resist the plant diseases of the Amazon Valley. Labor is the one factor now limiting a more rapid increase in production. Brazil is sparsely settled, and even high wages and the construction of model communities to house workers have failed to attract sufficient Brazilian labor to the jungle area where the plantations are located.

NEW ENGLAND

Rhode Island rubber manufacturers during November paid $479,625 in wages, 2.9% less than in October, but 62% over the November, 1940, figure. Electric power consumed by the industry for November totalled 2,837,000 kilowatt hours, against 2,125,000 in November, 1940.

The General Electric Co., Bridgeport Works, 1285 Boston Ave., Bridgeport, Conn., through Manager W. S. Clark, has announced the appointment of I. C. Eaton as engineer of the works laboratory, succeeding E. W. Schwartz, resigned.

Jacobs Rubber Products, Inc., a subsidiary of the E. H. Jacobs Mfg. Co., Inc., both of Danielson, Conn., according to Vice President J. E. Moe, is constructing a plant at Danielson for the manufacture of rubberized textile products. Operations are expected to begin this month.

New Brain Operation Utilizes Rubber Drainage Tube

Drs. J. C. White and Jost J. Michelsen, of the Harvard Medical School, Cambridge, Mass., have reportedly developed a new brain operation for hydrocephalus in which a six-inch rubber tube, having a ⅛-inch diameter, is permanently inserted into the gray matter. The tube, a No. 8 red catheter, commonly used by urologists, acts as an artificial drain for the fluid produced by the brain which an inoperable tumor blocks from its normal escape into the spinal column. The growth of such brain tumors is slow, and when the accumulation of fluid is prevented, the patient is assured added years of life.

The Danbury Rubber Co., Inc., manufacturer of rubber tile and mechanical rubber specialties, recently purchased the old Danbury Rubber Co., Danbury, Conn. It was originally planned to manufacture also tennis balls, toy balls, other toys, etc., but in view of the government stand on "non-essentials" the firm will continue making its regular line including flooring and defense items until restrictions on rubber manufacturing are withdrawn. About 100 workers will be employed, and an addition of 20,000 square feet will be built to the present structure as soon as practicable. Owners of the new concern are John E. Ryan, president and treasurer, who has had 15 years' experience in the rubber industry, mostly in Paris, France; and Fred T. Roberts, vice president, with a quarter-century's service to his credit.

Rhode Island is one of the communities which will be materially affected by the rationing of automobile tires and other curtailment of the uses of rubber. It is estimated that between 2,000 and 3,000 employes may be thrown out of work. Thus one plant which makes cut thread, golf balls, bathing suits, and toys may have to dismiss at least 1,500 workers, or half its force. Another firm, engaged in non-defense production, anticipates laying off 400 to 500 workers, or about two-thirds of its personnel. A thread manufacturer expects to be able to operate only a few weeks with the future uncertain. A proofed goods manufacturer likewise anticipates layoffs in non-defense departments although a footwear manufacturer has rearranged schedules so that as many employes as possible may work on defense orders. Another footwear concern has turned from waterproof footwear to non-waterproof footwear. Druggists' sundries makers are awaiting to learn how much of their production is essential for civilian use as well as for defense. All companies, however, are hoping for defense orders to be able to carry on.

As in other parts of the country, the decree limiting rubber consumption brought on a wave of golf- and tennis-ball buying in Rhode Island that assumed almost panic proportions. Dealers said recent stocks were plentiful, but held no hopes for the spring trade. One manufacturer, however, was reported as having about a year's supply of golf balls on hand. But the trade in rubber toys was merely normal.

OHIO

Seiberling Rubber Celebrates Twentieth Anniversary

On November 15 at a banquet attended by more than 200 male company officials and workers, the Seiberling Rubber Co., Akron, marked its twentieth anniversary, for the corporate charter was granted November 16, 1921. Highlight of the occasion was the awarding of gold, twenty-year service pins by President J. P. Seiberling to 33 executives and employes. First pin went to his father, F. A. Seiberling, age 82, co-founder, president until 1938, and now chairman of the board. His brother, C. W. Seiberling, 80, co-founder and first vice president, received the second pin. Other officials so honored were: W. Edwin Palmer, secretary; M. L. Brown, vice president in charge of production of Seiberling Rubber Co. of Canada, Ltd., Toronto, Ont.; J. L. Cochrun, vice president in charge of sales at Akron; C. A. Reed, assistant sales manager; Willard P. Seiberling, manager of Sealed-Air tube and accessories sales; I. B. Calvin, personnel manager; and A. A. Leedy, factory manager.

Other special guests included: J. Sherman, Seiberling's first dealer and president of Girard Hardware Co., Girard, Pa., who is still a Seiberling dealer; George J. Green, who built the company's first tire, which was on exhibition; W. A. M. Vaughan, vice president and treasurer, who with F. A. and C. W. Seiberling comprised the first board of directors; A. C. Blinn, president of Ohio Edison Co. and a Seiberling director; Edward S. Babcox, editor and publisher of *Tire Review Magazine;* and Jerome T. Shaw, editor and general manager of *Tires* magazine.

Speakers included the company founders, Colonel Cochrun, Mr. Palmer, Mr. Vaughan, H. P. Schrank, vice president in charge of production, and G. N. Kinkead, Akron branch manager.

Confident on Rubber Situation

President Seiberling recently announced that the action of the directors in declaring dividends on all classes of the company's stock was "in the nature of a vote of confidence in the ability of our nation to put Japan in her place." He said that present temporary dislocations in the rubber industry would soon be adjusted to admit a full production basis and that the armed forces of the nation would be able to maintain the supply line of crude rubber from the Far East. The Seiberling company is concentrating its tire production on types needed by the Army and for the transportation of defense materials.

Collyer Outlines Conservation Program

John F. Collyer, president of The B. F. Goodrich Co., Akron, a few days after the United States entry into the war, indicated the program in which the government and the rubber industry will cooperate to conserve the present American stockpile of natural rubber which he said was sufficient to cover normal needs for a year. Prudent use of reserve stocks; expanded production of synthetic rubber in 1942; extensive development of domestic sources of rubber such as guayule; and conservation of rubber products by the public were the four methods which would probably be relied on to effect conservation, he stated. Mr. Collyer also pointed out the efforts of the industry over a long period of years to conserve stocks, prolong the life of crude rubber, and develop age resisting qualities for rubber products.

Warns on "Reclaim" Tires

Mr. Collyer on December 22 warned that the rubber industry should not rush plans to make tires of reclaim rubber for civilian passenger-car use because thereby armed forces and agencies transporting vital goods might suffer from lack of needed reclaimed rubber.

Mr. Collyer expressed confidence that the OPM in making plans for the future will take into account the most advantageous use of reclaim and will undoubtedly want to establish restrictions on tires made of reclaim in the interest of the whole rubber conservation program.

Executive Changes

J. H. Connors, for ten years vice president in charge of the mechanical division of The B. F. Goodrich Co., Akron, resigned December 19 because of ill health. He had joined the company in 1901, and many promotions followed. Under his guidance the Goodrich mechanical rubber goods division has become one of the fastest growing in the industry, now listing more than 32,000 products in more than 1,000 lines.

James W. Schade, company research director since 1925, also has retired. His successor is Howard E. Fritz, for the past seven years director of the development and sale of koroseal. Dr. Fritz who came to Goodrich in 1925 from the engineering faculty of his Alma Mater, Ohio State University, was put in charge of a small department engaged in bonding rubber to metal which flourished rapidly under his guidance.

Mr. Shade joined the company in 1909 as a chemist. He was put in charge of technical work in the footwear department and in 1919 became manager of the department. In 1922 he was selected to direct the operation

of the company's testing laboratories and three years later was named director of research. Born in Brooklyn, N. Y., January 22, 1882, Mr. Schade attended Cornell University and was graduated in 1904.

The appointment of Arthur J. Martin as manager of the Goodrich Minneapolis district was announced last month by J. J. Newman, vice president. Mr. Martin has been with the company since September, 1914.

John L. Collyer, Goodrich head, is president of the Akron Mile-of-Dimes campaign to fight infantile paralysis.

Unusual Application of Rubber

Goodrich reports an unusual application of rubber in a large plant making plate glass, which has ordered 800 supports, 11-inch lengths of standard steel H beams with four-inch flat surfaces, covered with Armorite, a special rubber compound. Rubber on the top surface of the support cushions the end of the glass against chipping; while that on the bottom prevents the support from slipping on the floor.

Largest Industrial Tire

The world's largest industrial truck tire, a huge "doughnut" of rubber and steel capable of carrying more than seven tons, was built last month by Goodrich. Weighing 206 pounds, the tire, for industrial fork and ram trucks for moving strip steel in steel mills, is of solid rubber, with a grooved tread construction, is designated in size as 22x16x16, and has a rated carrying capacity of 14,450 pounds, at speeds of eight to 22 miles an hour.

Goodyear Activities

The Goodyear Tire & Rubber Co., Akron, held a two-day conference, December 4 and 5, for its district managers. Paul W. Litchfield, chairman of the board, discussed the company's defense activities; while President E. J. Thomas outlined plans to improve products. Sales Manager R. S. Wilson reviewed Goodyear's past five years from the sales and product standpoint.

Manufacturing Tires of Regenerated Rubber

Production of a passenger tire made entirely from regenerated rubber—strictly a war tire—is under way at the Goodyear factories. For satisfactory service speeds under 35 miles an hour are recommended. The tire, named "Defense", features a "V" in its tread design.

The Firestone Tire & Rubber Co., Akron, also one of the world's largest producers of reclaimed rubber, according to President Harvey S. Firestone, Jr., is now manufacturing a new "Victory" passenger-car tire made entirely of reclaimed rubber and said to give reasonably satisfactory service when driven at moderate speeds. The company is likewise developing a line of tractor and farm implement tires made entirely of reclaim.

Rubber-Latex Products, Inc., 1745 Front St., Cuyahoga Falls, O., was organized in 1941 for the production of latex surgical tubing for intravenous injection and blood transfusion and employs about 20 employes. Officers of the company include: president, M. M. Harrison; secretary-treasurer, H. A. Morton; general manager in charge of sales, J. C. Russell.

Midwest Production Association, 426 Terminal Tower, Cleveland, recently was formed by 55 midwest manufacturers to coordinate their defense efforts. Charles H. Oppenheimer is executive director.

FINANCIAL

Unless otherwise stated, the results of operations of the following are after all charges, federal income and excess profits taxes and other deductions. Figures in most cases are subject to audit and final year-end adjustments.

American Hard Rubber Co., New York, N. Y. January 1 to November 5, 1941: net profit, $525,087 after $500,000 provision for federal income and excess profits taxes. Year ended December 31, 1940, net profit, $456,457.

American Zinc, Lead & Smelting Co., Columbus, O., and wholly owned subsidiaries. September quarter: net profit, $54,129, equal to 79¢ each on 67,953 shares of $5 prior preferred stock, against $165,843, or 12¢ each on 673,088 common shares after preferred dividend requirements in the June quarter and $153,864, or 10¢ a common share, in the quarter ended September 30, 1940. First nine months, 1941: net profit, $443,426, or 27¢ a common share, against $407,504, or 22¢ a common share in the corresponding period of 1940.

Firestone Tire & Rubber Co., Akron, O. Year ended October 31, 1941: consolidated net income, $11,262,427, equal to $4.37 a common share, against $8,652,607 in the preceding fiscal year; net sales, $268,091,826, a record high, against $187,209,292; net profits from foreign subsidiaries, $2,947,154. Although nearly all European markets were lost, the company's export trade improved considerably because of better business with Latin America.

Pequanoc Rubber Co., Butler, N. J. January 1 to November 5, 1941: net profit, $233,220 after $280,000 provision for federal income and excess profits taxes. Year ended December 31, 1940: net profit, $142,337.

Master Tire & Rubber Corp., Findlay, O. First nine months, 1941: consolidated net income, $55,937 after provision for federal income taxes; earnings before taxes, $74,437, against $7,963 in the corresponding period last year; current assets, September 30, 1941, $1,168,213, current liabilities, $593,946.

Norwalk Tire & Rubber Co., Norwalk, Conn. Year ended September 30: net profit, after $36,000 provision for federal income taxes, $89,071, equal to 29¢ each on 202,230 common shares after annual dividend requirements on 8,784 shares of 7% cumulative preferred stock, on which unpaid dividends amounted to $3.50 a share on September 30, last; in the preceding 12 months occurred a net loss of $52,714.

Raybestos-Manhattan, Inc., Passaic, N. J., and domestic subsidiaries. First nine months, 1941: net profit, after $3,328,652 provision for estimated federal income taxes, $1,745,894, equal to $2.78 each on 628,100 shares of capital stock, against $1,359,622, or $2.16 a share, in the same period of 1940.

Sun Oil Co., Philadelphia, Pa., and subsidiaries. First nine months, 1941: net profit, $10,597,555, equal, after preferred dividend requirements, to $3.98 each on 2,580,898 common shares, excluding 11,897 in the treasury, contrasted with $5,502,352, or $2.12 each on 2,434,842 common shares in the same period of 1940.

S. S. White Dental Mfg. Co., Philadelphia, Pa. First nine months, 1941: net profit, $401,625, equal to $1.36 each on 294,011 capital shares, against $178,452, or 61¢ a share, last year. September quarter: net profit, $78,096, or 26¢ a share, against $57,461, or 20¢ a share, in the same period of 1940.

CANADA

Sale of New Tires Prohibited

The freezing of all stocks of new rubber tires in Canada except those delivered with the purchase of new vehicles was announced late December 11, by Munitions and Supply Minister C. D. Howe, as follows:

"As of 4 p.m. EDT today (December 11) no person in Canada may sell or deliver to any one new and unused rubber pneumatic tires and tubes for any type of automobile, bus, truck, farm implement, or motorcycle or any other type of rubber pneumatic tires and tubes.

"The new order specifically covers manufacturers, wholesalers, retail dealers, mail order houses, filling stations, automobile dealers or any other business except sales to government departments.

"The restriction does not apply to the sale of used tires and tubes and retreaded tires, or to the sale of tires and tubes furnished with new vehicles.

"The order remains in effect until further notice, and severe penalties are provided for violation."

The statement was promulgated on the advice of the rubber advisory committee by Alan H. Williamson, controller of supplies, with the approval of R. C. Berkinshaw, chairman of the Industrial Control Board.

The Munitions and Supply Department on December 14 announced that passenger car and truck manufacturers have been advised that from December 15 they will not be allowed to equip new automobiles and trucks with spare tires. Buyers of new vehicles are urged to purchase second-hand tires and tubes to be carried as spares. Rubber necessary to make repairs will be made available so second-hand tires and tubes could be kept in service.

Mr. Berkinshaw later declared that permanent orders regulating sales of rubber tires are expected within a week or ten days, which "will make it possible for all legitimate requirements for new tires to be filled, and will protect existing inventories so that tires may be made available for essential uses." Rubber necessary to make repairs will be made available so second-hand tires and tubes could be kept in service.

Rubber Uses Curtailed

Government officials are drafting new regulations restricting the use of crude rubber in the manufacture of civilian goods in Canada to eliminate non-essentials. The regulations also will virtually cut off all Canadian exports of rubber articles for civilian customers. Although Britain, India, Palestine, New Zealand, Egypt, South Africa, Australia, the British West Indies, and other customers are in need of rubber articles which Canada exported in large quantities during normal times, considerable difficulties were encountered in trying to fill the demends.

All rubber stocks in Canada were placed under control last year. Rubber not now being processed is either in the possession of the government-owned Fairmont Co., Ltd., or under government regulation. The decree restricting rubber usage by civilian manufacturers calls for a 25% cut in January and 30% in February of the average monthly consumption during the 12 months ended May 31, 1941, but indications now point to still greater reductions.

It was estimated that under soon-to-be announced restrictions less than 1,800 tons of rubber monthly will be available to manufacture civilian products after meeting war industry needs. Of this, some 250 tons will be required for truck and other essential tires, and about 200 tons for fire hose, belts, and a host of other industrial needs regarded as essential in wartime. Other necessary products include certain footwear, medical and surgical supplies, and the requirements of electric, water, transportation, and other essential public utilities.

As part of Canada's rigid control of rubber supplies, the provision under which rubber tires and tubes, solid rubber tires, and rubber semi-manufactures and manufactures could be shipped to the British Empire without an export permit has been cancelled.

Ruling on Synthetic Rubber

Imported synthetic rubber is exempted from the requirement of a special import permit under an order in council effective from September 12, 1941, reported in Canadian Customs Memorandum WM No. 48 (Revised) of November 13, Ottawa. The new order amends the previous order of September 12, 1941, and defines the classes of rubber required to be covered by import permits as "crude natural rubber in all its forms excepting guayule and, without restricting the generality of the foregoing, includes liquid latex of natural rubber not compounded beyond the addition of preservative unmanufactured crude balata, and unmanufactured gutta percha." This definition conforms to that contained in an order of the Controller of Supplies dated November 4, 1941, applying to the control of rubber supplies in Canada.

Dominion Rubber Co., Ltd., Montreal, P. Q., at a dinner December 5 at Mount Royal Hotel honored about 150 employes who have at least a quarter-century service with the company when President P. C. Jones presented each worker with a 25-year badge. Other company executives present were: W. A. Eden, chairman of the board; Controller M. O. Simpson; C. C. Thackray, vice president and general manager; G. B. Rutherford, sales executive; M. L. Lippert, manager of the St. Jerome factory; Vice President G. W. Charles; and H. R. Nixon, of the board of executives. Messrs. Eden, Nixon, Charles, Rutherford, and Lippert were among those receiving the badges.

OBITUARY

Charles R. Park

CHARLES R. PARK, an authority on carbon black in rubber compounding died at Akron, O., December 12 following injuries sustained in a restaurant explosion December 11.

He was born at Tiffin, O., August 31, 1893, and was graduated from Cornell University in 1916. During 1916 to 1917 he was a chemistry instructor at the University of Minnesota and from 1917 to 1922, at the Massachusetts Institute of Technology. In 1923, Dr. Park became a research chemist for the Goodyear Tire & Rubber Co., Akron. In 1926 he organized at Los Angeles, Calif., a general chemical and rubber testing laboratory and assisted in the development of Goodwin carbon black. In 1928 he was again employed by Goodyear in charge of compounding research at the Los Angeles plant. In 1930 he joined the staff of the United Carbon Co., New York, N. Y. From May, 1931, he was associated with the Firestone Tire & Rubber Co., Akron.

Dr. Park was a member of the American Institute of Chemical Engineers, Rubber Division, A. C. S., Institution of the Rubber Industry, Alpha Chi Sigma, Gamma Alpha, Masons, Torch Club, Friends of Music, and the Silver Lake Council. He was also a contributor to several scientific journals.

Dr. Park is survived by his wife, his mother, one sister, and a son.

Funeral services were from the McGowan Funeral Home, Akron, December 15. Burial was at Stow, O.

Felix P. Donnelly

WORD has been received of the death, following a fall, in a Singapore, F. M. S. hospital, November 27, of Felix P. Donnelly, 40, managing director of the Goodyear Orient Co., Ltd. Mr. Donnelly, associated with the Goodyear Tire & Rubber Co. for the past 18 years, has spent the last eight in Goodyear service in the Far East. Survivors include his wife and a son.

Edwin C. Shaw

EDWIN COUPLAND SHAW, former vice president of The B. F. Goodrich Co., Akron, O., died November 25 at his home in Akron after a long illness. Mr. Shaw joined Goodrich in 1895 as a mechanical engineer; he was made assistant superintendent in 1901, general superintendent the next year, general manager in 1907, and vice president in charge of all factory operations in 1912. He retired in 1917, but remained on the board until 1926.

Mr. Shaw, who was born in Buffalo, N. Y., February 1, 1863, was a graduate of Yale University. He then worked for the following concerns before going to Goodrich: Otis Elevator Co., Binghamton, N. Y., Hydraulic Power Co., General Electric Co., and Akron Electric Light & Power Co.

Mr. Shaw was very active in civic affairs and was very well known for his philanthropic work. He managed the Springfield Lake (now the Edwin C. Shaw) Sanatorium; was past president of the Akron Art Institute, chairman of the Ohio Board of Administration, and a 50-year member of the American Society of Mechanical Engineers; was director of the committee looking after the welfare and recreation of all Ohio troops during the last World War and of the Akron City and Children's hospitals; aided in founding the Akron Red Cross Chapter, helped set up a strong public health department, and was an important factor in

many other civic groups. He belonged to several other organizations.

A widower, he leaves a sister.

Funeral services were held at his late residence November 28. Interment took place at Cuba, N. Y., November 29.

T. F. Carey, Sr.

THOMAS FRANKLIN CAREY, SR., manager of the hose, packing, and sundries departments of the Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., Passaic, New Jersey, died December 14, following a sudden heart attack, at the Ridgewood, N. J., Country Club.

He was born in Brooklyn, N. Y., October 4, 1886. In 1909 he received the B.S. degree from Brooklyn Polytechnic Institute and the following year did graduate work at Columbia University while serving as an instructor in chemistry at New York University.

Mr. Carey later worked as a chemist for Lackawanna Steel Co., Buffalo, N. Y., and the American Agriculture Chemical Co., Wilmington, Del. From 1911 to 1917 he was rubber chemist for the Electric Cable Co., Bridgeport, Conn., and the following year was factory superintendent of the Quabang Rubber Co., North Brookfield, Mass. In 1918 he became manager of the hose department of the Manhattan Rubber Co., in which capacity he continued to his death. He contributed various articles of scientific and technical journals.

Mr. Carey was a member of the American Society of Chemical Engineers, the Arcola and the Upper Montclair Country clubs, and the Shriners.

Surviving him are his wife, a son, a daughter, and two brothers.

Private funeral services were held December 16. Burial was in Valleau Cemetery.

Edwin Hurtubise

EDWIN HURTUBISE, 65, president of the Canadian Fire Hose Co., died in Montreal on December 10. Born in Montreal, Mr. Hurtubise graduated from St. Mary's College and then entered the Dominion Rubber Co. Later he joined the Canadian Fire Hose Co. and rose to be its president.

Surviving are two sons and five brothers.

F. N. Stubbs

FREDERICK NEELANDS STUBBS, head of the Western Rubber Co. of Canada, Alton, Ont., which he founded in 1927, died of a heart attack on October 20. Funeral services were held October 23, with interment in Alton Cemetery.

Mr. Stubbs was born June 24, 1883, at Caledon, Ont., and attended the local grade school and Orangeville High School. He was also a Mason.

He leaves his wife and four sons, who are now operating the business devoted to the manufacture of latex products.

FROM OUR COLUMNS

50 Years Ago—January, 1892

In spite of the fact that a chemist's knowledge is of such great value to the rubber manufacturer, it is said that only one concern in the United States has its own chemist, and that is the Boston Rubber Shoe Co. (p. 121)

The only suggestion they (Omaha hardware stores) can offer to manufacturers is that they furnish hose that will stand a pressure of 125 pounds without developing sieve-like propensities. (p. 107)

W. L. Sage & Co., of Boston, bought recently 42,000 cases of the Excelsior Rubber Co.'s goods. It is estimated that 112 railroad cars would be needed to ship this lot. A very few years ago a single order of only 5,000 cases of rubbers would have been considered very large. (p. 120)

25 Years Ago—January, 1917

According to the latest Census of Manufacturers dated 1914, 88,821 persons are engaged in the rubber industry. (p. 45 adv.)

The 1914 Census of Manufacturers reports that of the 199,543 total primary horsepower employed in the manufacture of rubber goods in the United States, 114,803, or 57.5%, is electric. (p. 187)

Beginning with the use of aniline oil, rubber chemists have added to the list until 30 or 40 accelerators are now known with which to cut the previous period of vulcanization in half, or better, and thus double production. (p. 189)

The following list includes the most important organic accelerators now in use: ammonium compounds, amino compounds, piperidine and derivatives, quinoline and derivatives, carbon bisulphide addition products with aniline. (p. 190)

The United States Navy's first dirigible balloon, the *DN-1*, has been shipped to the Naval Aeronautical Station, Pensacola, Fla., for final flying tests.

Reported from Brazil, one of the world's largest *Heveas* is 127 feet in circumference at the base and has a record of yielding for 120 days an average of 22 pounds of rubber a day. (p. 208)

The rubber industry, dependent upon merchant ships to maintain the supply of crude rubber, looks with approval upon the tendency toward control of American shipbuilding manifested by the purchase of the American Shipbuilding Co. by the American International Corp. (p. 188)

England's contemplated protective tariff holds possibilities that may prove detrimental to American interests. The imperative need of an adequate supply of rubber grown within our own borders becomes more than ever apparent. (p. 188)

Thomas H. Norton

BRIEFLY ill with pneumonia, Thomas Herbert Norton, an authority on synthetic dyes and resins, died December 2 at White Plains (N. Y.) Hospital. Dr. Norton was born at Rushford, N. Y., June 30, 1851. He graduated from Hamilton College in 1873, received the Ph.D. degree from Heidelberg University, Germany, two years later, and studied further at the Universities of Berlin and Paris.

Returning to the United States in 1883, he became professor of chemistry at the University of Cincinnati, and was later employed by E. I. du Pont de Nemours & Co., Inc., and the American Cyanamid Co. He also served for several years as editor of the *Chemical Engineer* and co-editor of the *Chemical Color and Oil Daily*.

Funeral services were held December 5 at his late residence in White Plains. A son survives.

Henry B. Manton

Henry B. Manton, 74, one-time treasurer, a director, and one of the founders of The Goodyear Tire & Rubber Co., died at his Akron, O., home December 19 following a three months' illness.

Mr. Manton was also president of the Robinson Clay Products Co. He was first employed by that company in 1887, became its treasurer in 1902, and succeeded to the presidency in 1909.

Funeral services were held December 22 with burial in Rose Hill Cemetery.

Two daughters and six grandchildren survive.

LETTERS FROM OUR READERS

EDITOR: Why let the English destroy the plantations? The rubber will be no good to the Japs for there is no one for them to sell to. And besides, when the situation is again right side up, the Japs will not have any need for rubber as they will have no manufacturing facilities.

No, by all means don't destroy the plantations; just loan them for such part of the duration as the Japs can hold them. In the meantime good old reclaimed rubber will do its stuff.

Sincerely,

JAMES H. STEDMAN

December 26, 1941.

LATIN AMERICA

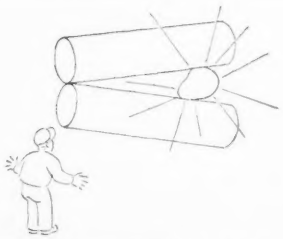
BRAZIL

Under the stimulus of existing conditions, Brazilian manufacturing industries continue to expand and in many cases now not only supply the home market, but also to some extent help to fill the needs of the neighboring South American countries. The production of rubber goods by Brazil, valued at 40,951,000 milreis in 1938, is estimated to have reached 103,000,000 milreis in 1940. The Brazilian rubber industry in 1940 imported among other materials, 53,976 kilos of latex, value 359,645 milreis, in addition to 70,884 kilos of accelerators, value 1,340,879 milreis.

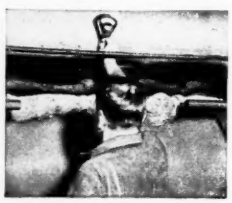
With increasing home production there has naturally been a decrease in imports of certain rubber manufactures; at the same time a small export business in various lines is developing. Figures for 1940 show that imports of rubber manufactures totaled 3,415,885 kilos, value 53,864,152 milreis. Tires and tubes for automobiles still constitute the great bulk of these purchases, the former amounting to 2,794,782 kilos, value 36,684,647 milreis, and the latter, to 148,334 kilos, value 2,885,378 milreis. Some of the other rubber goods obtained from abroad, were:

Products	Kilos	Milreis
Surgical goods	4,402	258,595
Rubber thread	84,599	1,810,476
Rubber combined with cotton, silk, or other fabrics	27,388	3,463,248
Machinery belting	133,292	3,463,248
Packing	8,885	378,750
Footwear	4,041	77,315
Toys	15,944	671,500
Sporting goods	5,251	289,839
Rubber sheet, with or without fabric inserts	19,813	642,780
Tubing	119,687	2,346,253

The 1940 exports comprised, first of all, raw rubber of all kinds to total 11,835,238 kilos, value 77,467,111 milreis, including 33,690 kilos of latex, value 221,122 milreis. Exports of manufactured goods amounted to 65,970 kilos, value 1,778,407 milreis; the chief items were combs and similar goods: In 1940 the 25,886 kilos, value 991,968 milreis. Next ranked rubber footwear, 16,887 kilos, value 441,974 milreis, followed by automobile tires, 8,571 kilos, value 129,048 milreis. Exports of tubes for automobile tires were 1,025 kilos, value 19,947 milreis.



WHEN LUMPS SHOW UP IN THE CALENDER ROLLS



Measuring temperature of Rubber Calender Roll

It's an even bet that the trouble is too hot mill work. But that is poor consolation for granular rubber or thickened gauge. Mill roll temperatures can be easily checked, therefore intelligently controlled, by the use of the Cambridge Surface Pyrometer. It is an accurate, sturdy instrument and can be used while rolls are in operation.

Send for the details of this instrument. It will help you save money and make better rubber.

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245 Fifth Avenue
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An agreement between Brazil and the United States insures that the exportation of certain strategic materials to a maximum of certain specific amounts will be restricted to the United States. The list includes rubber, all grades, up to a total annual quantity of 12,000 tons. The Metals Reserve Co. and the Rubber Reserve Co., both of Washington, D. C., undertake to acquire all the surplus existing in Brazil in those cases where private American industries do not buy all the materials, the prices to be agreed upon by the above companies and the Banco do Brasil.

ARGENTINA

The tariff concessions of a reciprocal trade agreement signed by United States and Argentine representatives October 14, 1941, and effective until November 15, 1944, cover a large share of the trade between the two nations. United States products benefiting from Argentine duty reduction include rubber hose, and specified buses, trucks, passenger automobiles, and their parts.

CUBA

Reports from Cuba state that the newly established rubber goods factory at Matanzas has started production, but owing to the lack of trained workers present daily output is only about 200 to 300 pairs of tennis shoes. Progress, however, is satisfactory, and in the next month or so daily output is expected to reach 2,000 pairs, to be increased to 5,000 pairs before long. The factory is equipped to produce still larger amounts if needed. As soon as the manufacture of tennis shoes proceeds in a smooth manner other goods as heels, cloth, etc., will also be made. But the original intention of eventually also manufacturing automobile tires and tubes is said to have been abandoned, at least for the present, because of lack of necessary machinery.

The Matanzas factory produces tennis shoes resembling those made in the United States, but of inferior quality. Wholesale prices, though will be 50 to 75% less than those for the United States article, now on the market; so a ready sale for the local product is looked for.

EUROPE

GERMANY

The Hoppler Konsistometer[1] has been designed by F. Hoppler for testing raw, intermediate, and finished products of the rubber industry. This instrument is described as an absolute Konsistometer, that is to say, the momentarily persisting condition of viscous, semi-solid, and solid substances, caused by thermal mechanical and time influences, and their behavior under normal or shear stress, are measured as a material constant without the aid of empirically obtained constants, from the geometrical measurements of the instrument itself.

The measurements are indicated in the C.G.S. system, and the following phenomena can be determined: viscosity, quasi-viscosity, plasticity, flow point, η-flow point, flow curve τ/γ for purely viscous, quasi-viscous, purely plastic and quasi-plastic, solidifying, micro- and block flow, thixotropy, rheopexy, dilatancy, solidifying phenomena, cone-flow-point (hardness), in addition to elasticity phenomena like spontaneous and after-compression, spontaneous and after-recovery, visco- and plasto-elastic deformation, thermo-recovery, elastic hysteresis, etc.

To carry out all these diverse measurements, the Hoppler Konsistometer is equipped with four attachments. Device I and II are used for rheological, III for elastometric, and IV for hardness determinations.

Device I. In a hollow cylinder H a sphere coaxially attached to a guide rod (C) moves in the material (M) to be measured; the latter flows laminally through the concentric ring space between sphere and hollow cylinder. With the aid of a lever-arm G having ball-bearing, the sphere is loaded by means of suspended weights, and a shear stress of 0.125 to 60 kg./cm.^{2} is exercised on the flowing material. The movement of the sphere, and thus the average flow rate of the material, can be followed on a register U, (which is magnetically coupled to the guide rod) within a measuring limit of 20 millimeters with a reading precision of 0.002.

Device II. The material to be examined is in a small container with capacity of 2 cm.^{3} and is deformed by a stamper consisting of a truncated cone with very acute base angle. Here too the material streams through a concentric ring space. (Shear stress range, 0.25 to 75 kg./cm.^{2}).

Device III. The material is deformed between two stamps having cross-section of 1 cm.^{2} (or 0.5 and 0.1 cm.^{2}). Load range is 0.25 to 50 kg./cm.^{2} (or up to 750 kg./cm.^{2}).

Device IV. A hard metal cone of special dimensions penetrates the material to be tested under load that can be varied from 0.25 to 50 kg., for such a period and so deeply, until the flow point of the adjoining surface parts is reached. Measuring range 1 to 50,000 kg./cm.^{2}

Measurements with the Konsistometer on natural and synthetic rubber solutions, treated and untreated raw rubber and buna, and vulcanized rubber and buna, have been reported. The flow curves of concentrated solutions of rubber and buna at different temperatures were determined, and it was found that thixotropy phenomena are independent of temperature. Flow curves at different temperatures were determined for raw rubber masticated for varying periods, and for buna, and the corresponding quasi-viscosity as well as flow point were found. A logarithmic-linear course of the η Q / t function was observed from which a new material constant was derived. The elastic and plastic deformation of vulcanizates was experimentally investigated under the definition "Deformation resistance"; it was proposed to indicate the "hardness" of hard rubber products by means of the cone flow point.

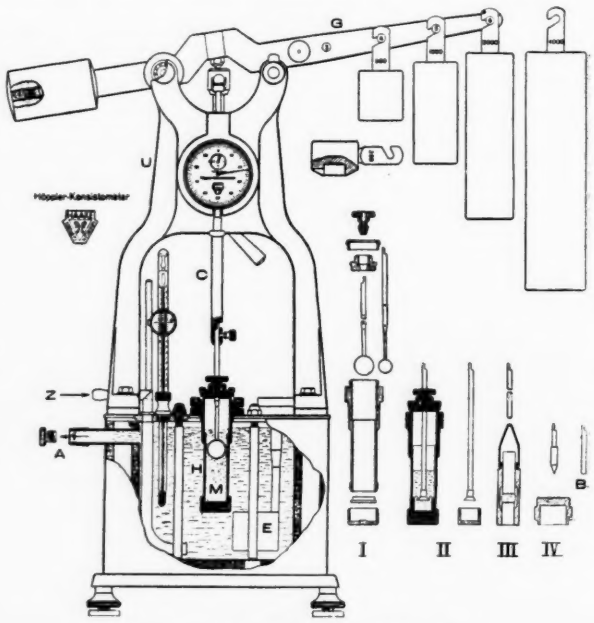

Diagram of the Hoppler Konsistometer

[1] "Rheological and Elastometrical Measurements of Rubber Products." F. Hoppler, *Kautschuk*, Feb., 1941, pp. 17-23.

GREAT BRITAIN

I.R.I. Papers Contest

F. D. Ascoli, chairman of the council of the Institution of the Rubber Industry, will present a silver medal for the best paper on any one of certain listed subjects submitted by a member of any Section of the Institution under 30 years of age. The runner-up will receive a bronze medal. The awards are to be known as the Chairman of Council's Medals. Prize winners and authors of other selected papers may have to read their papers before a meeting of the Institution to be arranged by their respective sections.

The Institution reserves the right to publish selected papers in the *I.R.I. Transactions;* those not selected for reading or publication, will be returned to competitors.

The following are the subjects from which competitors may choose: *Synthetic Rubber-like Materials:* to be considered from the scientific, technical and economic points of view, with special reference to competition with natural rubber for the latter; *Developments in Machinery and Processing during the Past Ten Years* and probable trend of future developments; *The Plasticizing of Rubber,* covering progress made in recent years; *Desiderata and Planning of Rubber Plantation Research* with a view to improvement in the quality of the product to meet existing and future requirements.

All papers, which must be typewritten, must reach the Secretary of the Offices of the Institution on or before March 31, 1942, and must be submitted under a *nom-de-plume.* The competitor's real name and address are to be enclosed in a sealed envelope addressed to the Secretary.

Ramie Fiber for Hose

A process for spinning ramie fiber to render it fit for use with rubber has been patented by Mark Sabner. The new material has been utilized for making fire hose, an especially important application at present in view of the vast needs of the Civil Defense Services. Several 75-foot lengths of such hose, subjected to stringent tests, proved superior to the usual types in various respects. They outlasted six other kinds and were still usable when the latter broke down under the tests. With the ramie hose, which in general appears to be lighter and more flexible than the customary hose, the joint is said to be the strongest section of a pipe. A panel of scientists appointed by the government to investigate the Sabner process reported themselves satisfied in all respects and recommended that a plant be erected to exploit the method.

Advertisement

Santa should try HYCAR for resistance to swelling.

See Page 429

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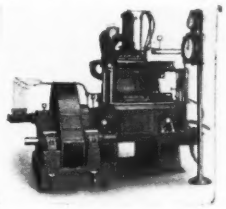
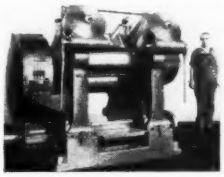


Banbury Mixers are key units in low cost production of quality products

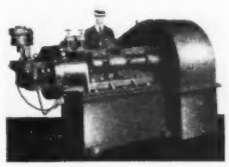
Performance-tested F-B Production Units are showing the way to mechanized material handling, to continuous processes, faster production and sustained high efficiency.



Tilted Refiners provide continuous high output and improved quality of reclaim.

Newly developed Production Units like the Hale Pelletizer and the Tilted Refiner, as well as improved designs of the widely known and used Banbury Mixer, Gordon Plasticator, F-B Tubing Machines and Bale Cutters, are giving users immediate and outstanding gains.

To work out the details of application of these F-B Production Units to individual problems, Farrel-Birmingham offers an unsurpassed engineering experience supported by exceptional manufacturing facilities and continuous research in the development of new and improved Production Units.



Uniform density and high productivity characterize F-B Tubing Machines with roller feed.

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234 North Cliff St., Ansonia, Conn.

Methods of Plasticizing Rubber

The various disadvantages of mastication and the merits of alternative methods of plasticizing rubber were the chief points of T. H. Cotton's paper on "Rational Processing", before the Leicester Section of the Institution of the Rubber Industry. After introductory remarks on masticating rubber, Mr. Cotton dealt with frozen rubber, showing that while normally frozen rubber has a melting point of about 31 to 33° C., once the rubber is thawed, it is not only very difficult to harden again at ordinary temperatures, (that is well below the original thawing temperatures), but after being refrozen in a refrigerator, it will soften again at temperatures as low as 8 to 10° C. The speaker further observed that masticated rubber, when stored at normal temperatures hardens more rapidly and completely than raw rubber: the degree of hardness reached increases with the amount of mastication. As this phenomenon has not previously been reported, Mr. Cotton proposes to investigate it more closely; he believes it may be responsible for the hardening in storage of mixed rubber stocks. It is further suggested that the hardening anomalies are due to the existence in rubber of at least two allotropic modifications having different melting points and that mastication has a profound effect on at least one of these. He rejects the view of van Rossem and Loticius that the lower melting point of refrozen rubber is due to the smaller size of the crystals compared with those formed in the original stored rubber.

On the subject of peak load, Mr. Cotton pointed out that this disadvantage is not overcome by using catalysts or so-called peptizing agents. Softening should take place before the rubber goes on the mill, but with these agents this necessarily occurs after the rubber reaches the mill or mixer. He also suggested that the continued action of these so-called peptizing agents during the process of incorporating compounding ingredients may lead to undesirable degradation of the rubber substance.

Studying alternative methods of softening rubber, Mr. Cotton carried out experiments to test the effect of temperature on plasticizing. He found that at 170° C. rubber was plastic enough to sheet and that up to 250° C. the plasticity of raw rubber increases without appreciable decomposition. Regarding the practicability of high temperature processing of rubber, he pointed out the chief difficulty was to achieve uniform heating throughout large masses of material. Other experiments were made to soften powdered rubber with the aid of certain accelerators, and results indicated that mixes containing 5% of MBT or DPG became slightly self-adhesive during ball-milling alone, and that as little as 0.5% of either accelerator caused distinct softening after heating for four hours at 90° C. After subsequent addition of sulphur and zinc oxide and curing, such softened rubber was said to give "pleasing" results. It was further shown that by applying the principle of catalytic softening to powdered rubber, especially in the presence of an efficient delayed-action accelerator, injection molding might prove practicable.

Referring finally to recent research which has shown that vulcanization with small proportions of sulphur involves little heat exchange, Cotton suggests that there is much scope for far-reaching economies here.

Incidentally while discussing thermal plasticization, Mr. Cotton remarked of the Ungar-Schidrowitz method[2] that this process "although showing some advantages over mastication, does not claim to give such a high-quality vulcanized product as would result if preliminary softening could be eliminated."

On which Schidrowitz comments in a note appended to his review of Cotton's paper:[3] "This statement is as regards *results obtainable*—I refrain from entering into a discussion on any other aspect—correct if the standard applied is that of a 'pure' i.e., a rubber/sulphur mix, although even in this case, the differences are not excessive. If, however, we apply the test of a practical works standard, e.g., that of a tread mix, then the statement referred to is substantially incorrect. It has been found by very careful and entirely comparable *factory* tests that in a tread mix, amongst others, the figures for modulus, strength and so on, for the mix made with softened rubber, are not inferior to those for the mix made with standard rubber, and, indeed, according to the degree of compounding, etc., may be superior. The explanation is simple: The mix made with the S.R. requires less 'knocking about' than the standard rubber mix, and the 'come-back' after vulcanization is, therefore, as good or better."

In a letter appearing in a later issue of the same paper, Typke & King, Ltd., state it has been manufacturing softened rubber for some years and has supplied thousands of tons to the trade. The letter emphasizes that if softened rubber is used in the correct manner, it gives results as good as and sometimes better than those obtained from raw rubber. Included were the following figures actually obtained in factory trials with a sidewall mix, (1) tread stock (2), and solid tire mix (3), to show that softened rubber gives results which, if anything, are superior to those obtained with ordinary masticated rubber:

	Tensile Strength		Modulus	
Mix	Raw Rubber	50/50 Fully Softened and Raw	Raw Rubber	50/50 Fully Softened and Raw
1	3,164	3,220	431	435
2	3,800	3,800	1,360	1,410
3	3,130	3,080	2,880	2,872

Aging in Geer Oven at 78° C.
(Time in hours to reach tensile product of 700,000)

	Raw Rubber	50/50 Fully Softened and Raw
1	225	250
2	436	436
3	123	145

Rubber Wings and Grilles for Motor Vehicles

The L.M.S. Railways has a large fleet of motor vehicles in service and at an exhibition recently held at Eustace Station demonstrated what it is doing to keep the vehicles in good order while at the same time conserving to the utmost all the materials needed for their maintenance. To protect the vehicles from damage, rubber has been successfully used to replace steel for mudwings and entire grilles, and rubber corners have been fitted to the scuttles of mechanical horse tractors. So satisfactory have these rubber parts proved that they are to be used on all new vehicles and all those sent in for repairs. To maintain maximum efficiency of the vehicles, the company provides mobile repair shops and welding plants; tires are given specialized care, worn treads are regrooved, and others, if their condition warrants, are retreaded. Special equipment has also been installed at one of the company's workshops to take care of major tire repairs, including accidental damage to fabrics.

New Controller of Dyestuffs

T. H. Hewlett, chairman and managing director of the Anchor Chemical Co., Ltd., and of Jos. Anderson & Sons, Ltd., and a member of the council of the Institution of the Rubber Industry, has been appointed to succeed the late Sir Robert Waddington as controller of dyestuffs.

FAR EAST

NETHERLANDS INDIA

New Research Laboratories

On September 20, 1941, were opened the new laboratories of the West Java Experiment Station intended for research work connected with the cultivation of tea and cinchona, and on plant physiology. About one-third of the cost of the build-

[1] *Trans. Inst. Rubber Ind.*, XVI, 303 (1941).
[2] British patent No. 368,902.
[3] *India Rubber J.*, Sept. 27, 1941, pp. 252-53.

ings was a gift from the former Soekaboemi and Rubber Planters' Association, (now the West Java Agricultural Association). The West Java Experiment Station, and consequently the new additions, are under the direction of Ch. Coster.

Raising Outputs

At the meeting of the West Java Agricultural Association held at Buitenzorg in connection with the inauguration of the new laboratories, J. S. Vollema read a paper on increasing the output of rubber. He declared that potentially the Netherlands India rubber estates are quite capable of producing the required quota of 120%. The rubber is in the trees; the problem is to find and adopt the best means of getting it out, which is largely a problem of administration.

Among the indirect means of increasing rubber output were closer supervision of tapping, supplying enough good tapping tools, and providing facilities for transporting latex from field to factory. Mr. Vollema pointed out that experienced tappers were skilled in depressing yields when they had to carry large amounts of latex for long distances and that it therefore paid to have centrally located places for collecting the latex from which it could later on be brought to the factory by auto trucks or tank wagons. Finally it was suggested that expert tappers—whose numbers are limited—should be accompanied by unskilled assistants whose job it would be to relieve the former of all those little tasks connected with tapping which require no special skill, but take up most of a tapper's time.

The direct methods that might be used include more intensive tapping systems. In Java especially, very mild systems were introduced in the slump and during the periods of sharp curtailment of permissible exports; the idea was to lower costs. In many cases these systems have been largely retained, and cuts therefore could advantageously be lengthened and rest periods, in periodical tapping systems, could be shortened. Double-cut systems, in which one is placed at the normal height, and the other about two feet higher, are receiving much attention, and advocates of such methods show that outputs can be increased by 45 to 100%, although admittedly the latter percentage is not usual. It is not advised to adopt such methods for permanent use, but only for the duration of the emergency.

Recovering Rubber from Bark

A practical planter has showed that a fair amount of rubber can be obtained by suitable treatment of the bark removed in tapping and now thrown away. His tappers brought in an average of 0.8-kilo of bark each, per day, and he succeeded in

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He uses HYCAR, sonny.
It resists heat better.

See Page 429

6 USES FOR "LIGHTNIN" MIXERS IN LATEX AGITATION

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2. Light compounding of Latex.
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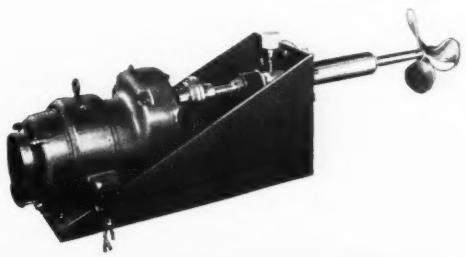
"LIGHTNIN" Mixers are also highly recommended for preparing rubber cement from slab rubber and solvent where viscosity does not exceed 4,000 centipoise. For complete details on "LIGHTNIN" Mixers for tanks of any size or shape, write to

"LIGHTNIN" Side Entering Mixers for storage tanks to prevent creaming of Latex.



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recovering 5.2 kilos of dry rubber from 100 kilos of bark at a cost of about 5.5 cents (Dutch currency) per kilo. The rubber could be profitably disposed of. In this way what has always been considered as waste material was made to yield additional amounts of rubber.

Exports of Crude Rubber

The Central Bureau of Statistics reports that in September, 1941, estates exported 37,641 tons of rubber, against a quota of 27,927.6 tons. The total exports by estates for the first nine months of the year came to 224,812 tons, against quota of 250,448.3 tons—showing a shortage of 25,636.3 tons.

Native rubber exports in September were 28,939 tons, against quota of 26,828 tons, and the total for the first nine months of 1941 was 246,477 tons. The quota for this period was 241,446 tons; there was thus an excess of 5,031 tons in native rubber exports.

MALAYA

The progress the Japanese are making in Malaya is being keenly followed, especially by the rubber industry whose chief sources of supply are being seriously menaced. Reports from Singapore, dated December 17, disclose that Japanese troops are fighting in Kedah, are infiltrating Province Wellesley, and are likely to capture Penang Island. Kedah, one of the Unfederated Malay States, is also one of the more important rubber centers in Malaya. Latest available statistics showed that at the end of 1940 it had a total area of 324,134 acres planted to rubber, of which 215,747 acres comprised estates over 100 acres in extent, while the remaining 108,387 acres were made up of small holdings of less than 100 acres. Of the total planted area 31,119 acres, or almost 10%, were budded; the budded area actually in tapping was 18,657 acres. Kedah's total production of rubber in 1940 was 60,036 long tons, of which 42,820 tons came from large estates.

Province Wellesley had a total rubber area of 69,075 acres, large estates of over 100 acres accounting for 45,251 acres, and small holdings, for 23,824 acres. Of the 2,027 acres in the budded area 292 were in tapping. Penang Island had a planted rubber area of 18,105 acres. Separate figures for the outputs of Wellesley and Penang, which form part of the Straits Settlements, are not available, but together they have about one quarter of the total rubber area of the Straits Settlements, and as the latter produced 41,638 tons of rubber in 1940, the output for the two sections may be assumed to have been roughly about 10,000 tons. As 1940 outputs were restricted, we may say that Malayan territories capable of an annual production of well over 70,000 tons are already directly involved in the hostilities in the East.

All of British Malaya, the 300-mile stretch of land from the Thailand border to Singapore, was reported to have in 1940 a rubber production capacity of 633,000 long tons, or 37% of the world's total capacity. Production capacity for Netherlands India was estimated at 705,000 long tons, or 41.2% of the total.[1]

BORNEO

Since the news also stated that the Japanese had reportedly gained a foothold in Borneo, it might be as well to give the rubber output for the different Borneo territories. In 1940, British North Borneo exported 17,623 tons of rubber, and Sarawak 35,166 tons. Dutch Borneo, however, is the chief producer of rubber here. Figures detailing exports of the Dutch part of the island during 1940 have not yet come to hand, but during the first half of 1940 the exports, almost exclusively of native rubber, were reported at 47,000 tons. It may therefore safely be estimated that the output for all of Borneo in 1940 was in the neighborhood of 150,000 tons.

[1] See map, page 409, this issue.

Editor's Book Table

BOOK REVIEWS

"Molding Technic for Bakelite and Vinylite Plastics." Published by the Bakelite Corp., Department T, 30 E. 42nd St., New York, N. Y. 1941. Cloth, 11¾ by 8¾ inches, 224 pages. Indexed. Price $3.50.

The fourth edition of this technical manual contains much factual information on both thermo-setting and thermo-plastic molding practice for molding material fabricators. The important phases of designing molded plastic parts, weighing, measuring, and preforming, mold design, heating media, finishing and inspection, and the equipment used in the production of molded plastic parts are thoroughly treated. The bakelite and vinylite synthetic resinous molding materials are briefly described. A list of the probable causes and remedies of imperfections in tabletting and compression and injection molding should be of immediate assistance in correcting difficulties; while a chapter on plastic nomenclature presents a working vocabulary of simple descriptive terms, relating to those visible characteristics of plastic objects which can be seen, but which cannot be expressed in numerical values. There are 177 photographs and line drawings descriptive of various molding operations and equipment. Conversion tables, mensuration formulas, steam and pressure tables, and other helpful engineering data are grouped at the end of the book.

"Rubber Producing Companies—1941." Compiled by the Mincing Lane Tea & Rubber Share Brokers' Association, Ltd., Plantation House, Mincing Lane, London, E.C.3, England. Published by *The Financial Times*, Ltd., 72 Coleman St., London, E.C.2, England. Boards, 5½ by 8¼ inches, 625 pages. Price, 10s. 6d.

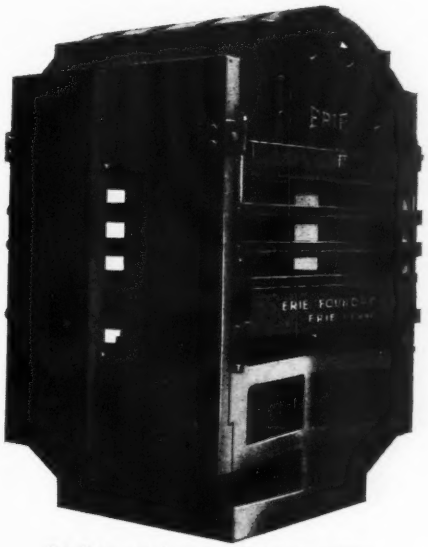
Each of the 550 crude rubber producing companies covered by this manual for investors is described separately in alphabetical order. Four hundred of them are shown in the new simplified style of compilation, and the editor anticipates that this recompilation will be completed in the next edition. The data include: date of registration, a list of directors and secretaries, financial structure, acreage, profits and dividends, balance sheet summary, and other pertinent information. In the preface the editor reports that for the first eight months of 1941 an average price of about 13½d. per pound had been obtained for crude rubber; that production costs had not exceeded 6d. per pound on most estates despite increased labor and materials costs; that all companies have made greatly increased profits, a large portion of which has been reserved for taxes. It is also stated that improved cultivation and replanting with budgrafted trees is continuing.

"Plastic Molding: A Comprehensive Study." D. A. Dearle. Published by Chemical Publishing Co., Inc., 234 King St., Brooklyn, N. Y. 1941. Cloth, 5¾ by 8¾ inches, 131 pages. Indexed. Price $4.

Written in a clear, simple style with few technical terms and much reiteration of basic factual material, this small book offers the layman and student a fundamental textbook knowledge of the practical aspects of the plastics molding industry. Concerned chiefly with the physical properties of plastic materials, the book omits chemical formulations and analyses from consideration.

A brief chronological historical introduction orients the reader for a fuller discussion of the modern field of plastics which includes a study of the various types of raw materials and the methods of their molding and finishing. Much useful instruction on presses and accessory equipment, plant layout, mold design, and die construction is presented, as well as chapters on production management and estimates and costs in a plastics factory. There are review questions at the end of each chapter which cover the material presented.

ERIE



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"Vegetable Gardening in Malaya." Malayan Planting Manual No. 3. J. N. Milsum and D. H. Grist. Published by the Department of Agriculture, Straits Settlements and Federated Malay States, Kaula Lumpur. 1941. Cloth, 5¾ by 8¾ inches, 206 pages, 52 plates. Indexed.

The authors described more than 80 varieties of vegetables suitable for Malayan culture and consider the propagation, cultivation, and uses of each. The control of garden pests and vegetable diseases are treated comprehensively, and a chapter on food values includes analyses of the nutritive, mineral, and vitamin content of Malayan vegetables. A section devoted to rubber estate gardens points out the success of the cooperative efforts of the planters and the government under the labor and land codes to improve the food supply and health of the laborers. In addition to the general index there are indexes to the Malay, Chinese, and Tamil vegetable names.

"Business as Usual. The First Year of Defense." I. F. Stone. Published by Modern Age Books, 245 Fifth Ave., New York, N. Y. 1941. Cloth, 5¾ by 8¾ inches, 275 pages. Indexed. Price $2.00.

Critical of the effects of large corporate industrial enterprises upon the national defense program, this book, written by an experienced newspaper correspondent and editorial writer, attributes the lag during 1940 and early 1941 in defense production to the reluctance of many manufacturers to increase supplies of raw materials and plant facilities in accordance with the size of swollen backlog orders, and the failure of large companies to sub-contract orders for parts to small idle or partially idle plants.

"Stockpiles 10,000 Miles Away", a chapter discussing various shortages of strategic materials, devotes several pages to the rubber problem of the United States, but the author's confusion of estimates in terms of tons and pounds detracts from his factual conclusions. On page 34 he writes, "A medium sized tank requires approximately 1,000 pounds of rubber" and on page 36, "250,000 tons a year would be enough for only 250 medium tanks." Mr. Stone estimates that defense needs will be hundreds of thousands of tons annually, and urging greatly increased production of synthetic rubber, he suggests that immediate large-scale production of synthetic rubber has been discouraged by those seeking to protect their interests in the plantations of the Far East.

NEW PUBLICATIONS

"The Basic Factors Retarding American War Production." No. 42 in a series of booklet-editorials. Farrel-Birmingham Co., Inc., Ansonia, Conn. 24 pages. Factors which retard armament production in the United States include strikes, the limitation of the work week to 40 hours, and the artificial stimulation of demands for wage increases, according to this booklet. The current rate of war production in the United States is estimated at one-third of the probable optimum required. Four tables computed from United States Department of Commerce and Bureau of Labor Statistics data supplement the text.

"Goodall Waterproof Clothing." Catalog No. 203. Goodall Rubber Co., Inc., 5 S. 36th St., Philadelphia, Pa. 12 pages. This new silver metaloid-bound catalog describes 150 styles of clothing designed for industrial and sporting use. Boots, rubber and oiled hats, aprons, gloves, coats, work suits, and rubber blankets are offered.

"Safety Clothing for Women in Industry." Special Bulletin No. 3, Women's Bureau, United States Department of Labor. Washington, D. C. 1941. 11 pages. Types of women's work clothing according to occupational safety standards are briefly discussed and illustrated in this pamphlet. Coats, aprons, hats, gloves, arm and leg protectors, and shoes of rubber or such synthetic materials as Koroseal, Vinylite, and Pliofilm are recommended for work hazards involving moisture, corrosive substances, and skin infections.

"When the Defense Booms Ends: Industry Plans for After the War." Prepared by the Research Advisory Service. Distributed by the Liberty Bank of Buffalo, Buffalo, N. Y., and other banks sponsoring the Research Advisory Service. 24 pages. Selected and condensed comments by some 80 manufacturers, management engineers, and economists suggest that present maintenance and expansion of industrial research may help to avoid a possible post-war depression. To keep up sales volume after the current defense market ceases to exist, manufacturers also emphasize the importance of the sales staff in building good-will and of a continuity or increase in advertising expenditures.

"The Baldwin Group in Production for Defense." The Baldwin Locomotive Works, 120 Broadway, New York, N. Y. 24 pages. This large illustrated folder describes the production of defense arms, shells, tanks, ship propellers, marine Diesel engines, hydraulic presses for aircraft parts, and tools and machinery for other defense industries manufactured by various divisions of the Baldwin organization.

"National Defense Fires." National Fire Protection Association, 60 Batterymarch Street, Boston, Mass. 16 pages. Sixteen full page illustrations of fires that destroyed defense materials or plants in 1941 show graphically the importance of fire prevention, protection, and safety in defense industries and warehouses. Causes and effects of each fire are briefly discussed including the conflagration at Fall River, Mass., that burned for 13 days and destroyed an appreciable amount of this country's rubber reserve.

"Eight Plies of Useful Hose Information." United States Rubber Co., Rockefeller Center, New York, N. Y. 8 pages. In the form of an enlarged section of hose, with each page representing one ply, this folder shows cut-away sectional drawings of steam, water, air, gasoline, oil, and suction hose. Each page has suggestions for the proper care of hose.

"Doing Business with the Procurement Division." Treasury Department, Procurement Division, Washington, D. C. November, 1941. 15 pages. This booklet describes the competitive bid buying procedure of the federal government and details the various steps in consummating contracts. A synopsis of federal laws affecting procurement and a list of the addresses of 43 branch Procurement Offices are included. Free copies are available from the Procurement Division, Washington, D. C.

"Chemical Industries Buyer's Guidebook Number." October, 1941. Chemical Industries, 522 Fifth Ave., New York, N. Y. 736 pages. This guidebook, a supplementary annual number of the magazine *Chemical Industries* contains 1936-40 chemical prices, purchasing guides for chemicals, raw materials, and specialties, a firm directory, geographically arranged, a list of associations and societies, and an index of synonyms, brands, and trade names. Included for the first time are: an alphabetical listing of equipment and container manufacturers and dealers; a buying guide for equipment and containers; and a data section which consists of miscellaneous tables for technical reference.

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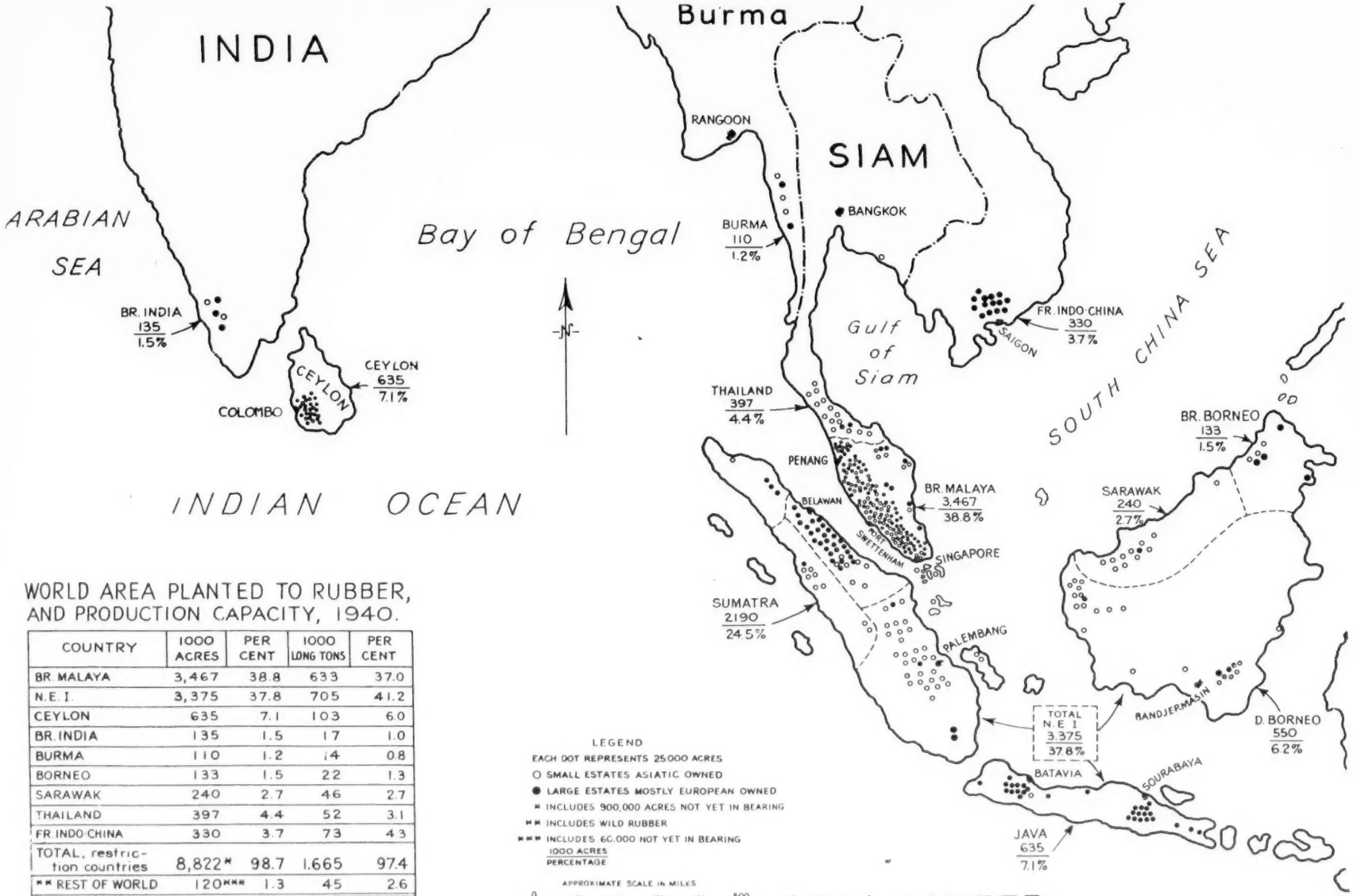
Rubber Producing Areas in the Far East



WORLD AREA PLANTED TO RUBBER, AND PRODUCTION CAPACITY, 1940.

COUNTRY	1000 ACRES	PER CENT	1000 LONG TONS	PER CENT
BR. MALAYA	3,467	38.8	633	37.0
N.E.I.	3,375	37.8	705	41.2
CEYLON	635	7.1	103	6.0
BR. INDIA	135	1.5	17	1.0
BURMA	110	1.2	14	0.8
BORNEO	133	1.5	22	1.3
SARAWAK	240	2.7	46	2.7
THAILAND	397	4.4	52	3.1
FR. INDO-CHINA	330	3.7	73	4.3
TOTAL, restriction countries	8,822*	98.7	1,665	97.4
** REST OF WORLD	120***	1.3	45	2.6
GRAND TOTAL	8,942	100.0	1,710	100.0

Reprinted from INDIA RUBBER WORLD June 1, 1941

RUBBER MANUFACTURERS ASSOCIATION,

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RUBBER IN MEASURING INSTRUMENTS. *Rubber Age (London)* Sept., 1941, pp. 173, 179.

(Continued on page 422)

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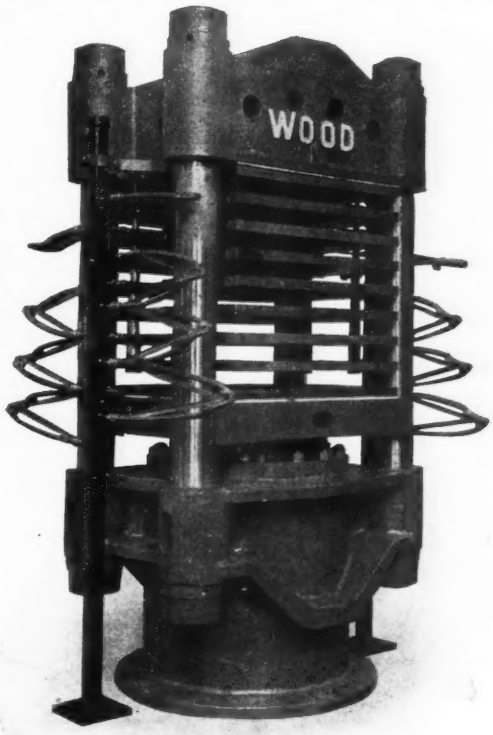
See Page 429



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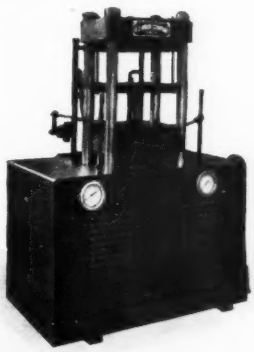

(Above) An 8-opening, steam platen press operating on 2000 lbs. per square inch working pressure. Platen size—40" x 40".

(Left) A 50-ton Hydro-Lectric steam platen press with self-contained pumping unit. Pumps, motor, valves and piping are fully enclosed.

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2,258,634. **Abrading Apparatus** with Rubber Mats on Work-Supporting Tables. D. C. Turnbull, assignor to American Foundry Equipment Co., both of Mishawaka, Ind.

2,258,640. **Railway Center Plate Structure** with Rubber Elements in Shear. E. S. Beckette, East St. Louis, assignor to General Steel Castings Corp., Granite City, both in Ill.

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2,258,687. **Concentric Electric Cable.** T. F. Peterson, Worcester, Mass.

2,258,707. **Bottle Crate** with Elastic Tubular Cushion Elements. F. G. Krueger, Norwood, and F. H. Hudepohl, St. Bernard, both in O.

2,258,720. **Tourniquet** Comprising a Pliable Elastic Band. E. S. Saighman, Waverly, Mo.

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2,259,018. **Decoy Duck Head** with Vacuum Cup Attachment. R. W. Benson, Orion, Ill.

2,259,023. **Well Pipe Grief Collar** with Rubber Insert. H. H. Clark, Los Angeles, Calif., assignor to National Supply Co., Pittsburgh, Pa.

2,259,049. **Side Bearing** with Rubber Elements. H. G. Swan, East Aurora, and F. G. Suckow, Bowmansville, assignors to Symington-Gould Corp., Rochester, all in N. Y.

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2,259,158. **Storage Battery Cell Cover Assembly.** H. J. Flikkie, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,259,160. **Orthodontic Device.** C. G. Glaser, Buffalo, N. Y.

2,259,182. **Overshoe.** P. Y. Smiley, Kitchener, Ont., Canada, assignor to B. F. Goodrich Co., New York, N. Y.

2,259,185. **Refrigerator Cabinet** Having Resilient Molding. E. Swedman, assignor to Seeger Refrigerator Co., both of St. Paul, Minn.

2,259,256. **Manufacture of Containers** Employing Heat-Sealable Material. E. F. Maas, near Cuyahoga Falls, and C. R. Kline, Akron, both in O., assignors to Wingfoot Corp., Wilmington, Del.

2,259,348. **Golf Ball** with a Cover Which Comprises a Condensation Derivative of Rubber and a Substantial Amount of Rubber Hydrochloride. J. A. Merrill, Akron, O., assignor to Wingfoot Corp., Wilmington, Del.

2,259,349. **Golf Ball Cover** of a Material Comprising an External Phase Consisting of Balata, Gutta Percha, or Condensation Derivatives of Rubber and, Distributed Therethrough, an Internal Phase Consisting of Discrete Particles of a Vulcanized Soft Rubber Powder, Substantially All of Which Will Pass through a 50-Mesh Screen. J. A. Merrill, Akron, O., assignor to Wingfoot Corp., Wilmington, Del.

2,259,350. **Coating** for Steel Comprising a Mixture of Rubber from Latex and the Sodium Salt of Shellac and an Outside Coating of Rubber from Latex Free from Shellac. J. A. Merrill, Barberton, O., assignor to Wingfoot Corp., Wilmington, Del.

2,259,413. **Picker.** C. W. Yelm, assignor to Gates Rubber Co., both of Denver, Colo.

2,259,440. **Automobile Bumper Guard** with Pneumatic Cushion Members. R. B. Fageol, Beverly Hills, Calif.

Dominion of Canada

399,954. **Structure for Letterpress Printing** Comprising a Thin Metallic Element on a Backing of Rubber. Frazier Processes, Inc., New York, N. Y., assignee of P. A. Frazier, Oak Park, Ill., both in the U. S. A.

399,980. **Floor Covering** with Rubber Edge. National Automotive Fibres, Inc., assignee of G. R. Cunnington, both of Detroit, Mich., U. S. A.

399,982. **Eye-Bath Spray** with Bulb. Optrex, Ltd., London, assignee of H. M. Seward, Greenford, Middlesex, both in England.

400,000. **Universal Joint** with Rubber Elements. Thermoid Co., Trenton, N. J., U. S. A., assignee of N. B. Strachovsky, Paris, France.

400,023. **Footwear** with Finish Bead of Elastic Material. S. Zide, Lynn, inventor, J. I. Schoen, Boston, and D. Fluke, Swampscott, each an assignee of ⅓ of the interest, all in Mass., U. S. A.

400,052. **Valve** with Collapsible Conduit Element of Rubber and Fabric. G. G. Grigsby, Desloge, Mo., U. S. A.

400,104. **Cellulose Nitrate Coating Composition Applying Apparatus** Utilizing an Electrically Heated Flexible Hose Having an Inner Layer of a Plastic Polymer of 2-Chlorobutadiene-1,3. Canadian Industries, Ltd., Montreal, P. Q., assignee of E. C. Pitman, Red Bank, N. J., U. S. A.

400,121. **Rubber Valve Stem.** Dill Mfg. Co., Cleveland, O., assignee of O. W. Hosking, Monroe, N. Y., both in the U. S. A.

400,130. **Tire Sidewall Covering,** for Application to a Vulcanized Tire Casing, Consisting of a Volatile Solvent Solution of Rubber Containing a Suspension of Titanium Dioxide and a Non-Volatile Anti-Discolorizing Agent, the Ratio of Rubber to Pigment Being Such as to Form an Elastic Layer Capable of Flexing without Cracking or Peeling. R. M. Hollingshead Corp., Camden, N. J., assignee of T. J. Bagley, Haddonfield, both of N. J., and V. M. Mantz, Philadelphia, Pa., co-inventors, all in the U. S. A.

400,182. **Synthetic Rubber Grease Nipple Cover.** N. B. Newton and J. H. Naden, co-inventors, both of London, England.

400,228. **Road Rolling Machine** on Pneumatic Tires. Wm. Bros. Boiler & Mfg. Co., assignee of J. R. Ritchie, both of Minneapolis, Minn., and A. S. Miller, Fargo, N. D., co-inventors, both in the U. S. A.

400,360. **Reflector Device** with Rubber Gripping Member for Attachment to Flashlights. O. G. Evans, Danville, Va., U. S. A.

400,430. **Resilient Car Wheel.** Carnegie-Illinois Steel Corp., assignee of D. P. Stewart, both of Pittsburgh, Pa., U. S. A.

400,438. **Ceramic Article** Manufacture Using a Flexible Mold. Dental Research Corp., assignee of R. W. Erdle, both of Chicago, Ill., U. S. A.

400,479. **Windshield Wiper Arm.** Productive Inventions, Inc., assignee of J. W. Anderson, both of Gary, Ind., U. S. A.

400,484. **Preformed Pipe Insulation** Comprising Gas-Expanded Rubber Containing a Multiplicity of Minute Closed Cells, the Insulation Having an Inner Veneered Surface of a Material Comprising Rubber, Cork, and Sulphur and an Outer Veneered Surface of a Material Adapted to Render the Pipe Insulation Non-Inflammable. Rubatex Products, Inc., assignee of D. Roberts, both of New York, N. Y., L. Cooper, Milford, Conn., and F. Peel, Memphis, Tenn., all in the U. S. A.

400,503. **Cushioning Unit** Having a Rubber Bearing. Symington-Gould Corp., assignee of E. H. Blattner, both of Rochester, N. Y., U. S. A.

400,513. **Plastic Bearing** Composed of an Infusible Phenolic Condensation Product and a Lubricant Absorbing Filler. Trico Products Corp., assignee of R. C. Timm, both of Buffalo, N. Y., U. S. A.

400,526. **Rolled Tape** Comprising a Flexible Strip of Porous Fibrous Material Having a Filling of Vulcanized Rubber, a Co-extensive Coating of Pressure Sensitive Rubber Base Adhesive on One Face of the Strip, and a Separator Coat Formed for the Most Part of Ethyl Cellulose and Extending over and Bonded to the Other Face of the Strip. Van Cleef Bros., a partnership consisting of N., F., and P. Van Cleef, assignees of P. Van Cleef, all of Chicago, Ill., U. S. A.

United Kingdom

539,485. **Joint or Connection** for Chain-Links, Etc. Dunlop Rubber Co., Ltd., and G. B. Ainsworth.

539,785. **Artificial Sponges.** Sponcel, Ltd., and C. V. Barker.

539,829. **Pneumatic Cushions.** United States Rubber Co.

539,907. **Compound Sheet Material or Fabric.** Dunlop Rubber Co., Ltd., W. Lord, and S. A. Brazier.

PROCESS

United States

2,259,239. **Bags** of Heat-Sealable, Thermally Stretchable Material. G. M. Brown, New York, N. Y., and J. E. Snyder, Akron, O., assignors to Wingfoot Corp., Wilmington, Del.

2,259,347. **Uniting a Plurality of Plies** of Heat-Sealable and Thermo-Stretchable Material. G. D. Mallory, Akron, O., assignor to Wingfoot Corp., Wilmington, Del.

2,259,352. **Producing Clear Rubber Hydrochloride Film** by Supplying Sufficient Heat to the Exposed Surface of a Freshly Cast Film of the Cement during the Rapid Evaporation of a Low-Boiling Solvent Therefrom to Prevent Premature Solidification of the Rubber Hydrochloride Which Would Result in the Formation of Irregularities in the Surface on Completion of the Evaporation of Solvent from the Film. H. J. Osterhof, Cuyahoga Falls, O., assignor to Wingfoot Corp., Wilmington, Del.

2,259,355. **Forming Clear Rubber Hydrochloride Film** by Casting a Cement of a Rubber Hydrochloride in a Low-Boiling Solvent on a Surface, Blowing Heated Air against the Exposed Surface of the Film Immediately after It is Cast, at Such a Rate and Temperature as to Effect Evaporation of Solvent without Effecting Premature Solidification of Rubber Hydrochloride Which Would Produce Irregularities in the Surface of the Film on Completing the Evaporation of Solvent therefrom. L. B. Sebrell, Silver Lake, O., assignor to Wingfoot Corp., Wilmington, Del.

2,259,560. **Ventilated Fabric.** A. A. Glidden, assignor to Hood Rubber Co., Inc., both of Watertown, Mass.

2,260,143. **Making Polished Rubber Articles** by Subjecting a Molded Rubber Compound Article for from Three to Five Minutes to the Action of a Solution Composed of 50% of a 1½% Calcium Hypochlorite Solution and 50% of 1% Hydrochloric Acid Solution, Rinsing the Article in Water, Drying, Rinsing in Alcohol, and Then Polishing. W. H. Juve, Akron, assignor to Monarch Rubber Co., Hartville, both in O.

2,261,165. **Manufacture of Rubber Goods from Latex** Comprising Preparing a Latex Composition Preserved with an Alkanolamine and Containing Insufficient Metallic Activator for Vulcanization, Depositing Rubber Coagulum from the Latex in a Form, Diffusing Therein a Quantity of Soluble Metallic Activator Which Will be Precipitated by the Alkanolamine, Drying and Vulcanizing the Rubber. R. A. Lees, assignor to American Anode, Inc., both of Akron, O.

2,261,166. **Reclaiming Rubber** by Heating Fiber-Containing Vulcanized Scrap with a Small Proportion of a Mild Alkali. M. Levin, Baltimore, Md., assignor of 8/20 to J. T. Bassechès, New York, N. Y.

2,261,181. **Stenciling Masks.** D. G. Rempel, assignor to Sun Rubber Co., both of Barberton, O.

2,261,459. **Making Closed Cell Gas Expanded Rubber** by Mixing a Diazo Amidine, the Amidine Being Free from Substituents Capable of Azoic Coupling, with Rubber, Partially Vulcanizing the Mix at a Temperature Sufficiently High to Obtain the Necessary Fiber Strength of the Rubber, and Raising the Temperature to Decompose the Diazo Amidine and Evolve Nitrogen to Expand the Rubber. L. Cooper, Milford, Conn., H. Z. Lecher, Plainfield, and F. H. Adams, Somerville, both in N. J., assignors to American Cyanamid Co., New York, N. Y.

2,261,465. **Wheels** with Rubber-Like Treads. E. A. Grange, A. F. Kaptuller and E. J. Schmidt, assignors to Allied Engineering Co., all of Chicago, Ill.

2,261,832. **Producing a Rubber Article** by Forming a Strip of Wet Latex, Drying to Form a Rubber Strip, and Stretching and Heating the Dried Strip to Relieve the Stresses Set up by the Elongation Thereof, the Rubber Being Free from Vulcanization Agents to Avoid Vulcanization upon Heating, Dusting Sulphur upon the Rubber and Vulcanizing the Rubber to Retain It in Its Elongated, Relieved Form. H. W. Greenup, assignor to Firestone Tire & Rubber Co., Akron, O.

2,261,847. **Continuously Curing a Rubber-Coated Metallic Conductor** by Continuously Passing the Conductor Past an Electrode Surrounding the Rubber While Imposing High Frequency Alternating Currents between the Conductor and Electrode to Heat the Rubber Composition Internally to a Vulcanizing Temperature. R. Dufour, Paris, and H. A. Leduc, Asnieres, both in France.

2,262,116. **Laminated Conveyer Belt.** W. E. Perkins, assignor to Raybestos-Manhattan, Inc., both of Passaic, N. J.

2,262,493. **Method of and Means for Making Quilted Rubber Sheeting.** R. H. Guinzburg, Montrose, assignor to I. B. Kleinert Rubber Co., New York, both in N. Y.

2,262,608. **Making a Composite Article of Rubber and Cellulose Fabric** by Impregnating the Fabric with a Composition of Partially Polymerized Divinyl Acetylene and Rubber, the Ratio of the Divinyl Acetylene to Rubber Being in the Range of 1:2 to 1:6 Parts by Weight, Thereafter Exposing the Impregnated Fabric to an Oxygen-Containing Atmosphere to Set the Divinyl Acetylene, and Then Vulcanizing a Rubber Composition in Intimate Contact with the So-Treated Fabric. B. J. Humphrey, assignor to Firestone Tire & Rubber Co., both of Akron, O.

Dominion of Canada

400,105. **Producing Nitrocellulose-Coated Rubberized Sheet Material** by Applying to the Surface of Rubberized Sheet Material at Least One Bonding Coat Comprising Polyvinyl Phthalate and Subsequently Applying Thereto a Nitrocellulose Lacquer. Canadian Industries, Ltd., Montreal. P. Q., assignee of J. H. McGill, Manchester, England, and H. J. Tattersall, Ardrossan, Scotland, co-inventors.

400,175. **Manufacturing a Waterproof Transparent Sheet Material** by Coating a Cellulose Hydrate Layer with an Intermediate Coating Comprising a Main Amount of Chlorinated Paraffin, a Lesser Amount of Chlorinated Rubber, and a Still Lesser Amount of a Resin and a Wax Dissolved in Volatile Solvents. E. Czapek, Berlin, Germany.

400,440. **Making Rubber-Coated Cotton Material** by Initially Dewaxing the Cotton, Impregnating It with an Adhesive (Aqueous Dispersion of Rubber, Resorcinol, and Formaldehyde), Drying the Impregnated Material at Superatmospheric Temperature, and Coating the Dried Material with Rubber. Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ont., assignee of Dunlop Tire & Rubber Corp., Buffalo, N. Y., U. S. A., assignee of E. W. Madge and E. A. Murphy, co-inventors, both of Birmingham, Warwickshire, England.

400,442. **Treatment of Cord for Pneumatic Tires** Which Comprises Forming a Vulcanizable Adhesive by Mixing Together Dry Rubber, Sulphur, and Vulcanizing Agents Together with a Small Proportion of an Aldehyde or Ketone, Treating Fabric Cord with the Adhesive and Bonding the Treated Cord to Rubber by Vulcanization. Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ont., assignee of J. Haworth. Birmingham, Warwickshire, England.

United Kingdom

539,786. **Porous or Spongy Articles** of Rubber and Rubber-Like Material. J. A. Talalay.

539,801. **Purifying and Concentrating Rubber Latex** by Centrifuging. Aktiebolaget Separator.

MACHINERY

United States

2,259,058. **Mixing Mill.** R. W. Allen, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,259,161. **Floatable Deposition Belt** with Rubber Edge for Depositing Rubber Thereon from Latex. M. E. Hansen, assignor to American Anode, Inc., both of Akron, O.

2,259,162. **Tire Building Machine.** A. C. Hirsch, J. F. Cullen, A. R. Krause, and H. O. Hutchens, all of Eau Claire, Wis., assignors, by mesne assignments, to United States Rubber Co., New York, N. Y.

2,259,430. **Vulcanizing Press.** L. E. Soderquist, assignor to McNeil Machine & Engineering Co., both of Akron, O.

2,259,571. **Coating Apparatus.** S. D. Klyce, Lexington, Mass., assignor, to B. F. Goodrich Co., New York, N. Y.

2,259,975. **Tire Retreader.** F. B. Hewel, Pittsburgh, Pa.

2,260,448. **Ball Winder.** R. S. Francis, Rumford, R. I., assignor to United States Rubber Co., New York, N. Y.

2,260,854. **Dipping and Distributing Apparatus.** E. S. Killian, assignor to F. B. Killian & Co., both of Akron, O., a partnership composed of F. B. Killian, J. Tyrrell, trustee, and P. H. Stevens.

2,260,921. **Winder** for Elastic Yarn. C. R. Sibley, Marblehead, assignor to Sibley-Pym Corp., Lynn, both in Mass.

2,260,966. **Vulcanizer.** J. W. Brundage, assignor to Summit Mold & Machine Co., both of Akron, O.

2,261,775. **Apparatus for Making Insulating Tape.** C. Mosier and J. L. Mohun, Jr., both of Chicago, Ill., assignors to Union Asbestos & Rubber Co., a corporation of Ill.

2,261,837. **Bias Cutter.** R. W. Allen, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,262,135. **Tire Trimmer.** J. C. Carlin, Norristown, assignor to Lee Rubber & Tire Corp., Conshohocken, both in Pa.

2,262,259. **Tread Stitcher.** F. J. Shook, assignor to National Rubber Machinery Co., both of Akron, O.

2,262,596. **Tire Regrooving Device.** C. A. Watkins, Forest Hills, N. Y.

United Kingdom

539,857. **Vulcanizing Presses.** McNeil Machine & Engineering Co.

539,925. **Apparatus for Mixing and Whipping Liquids.** United States Rubber Co.

539,927. **Apparatus and Method for Separating a Ribbon or Rubber Threads** into Its Individual Threads. United States Rubber Co.

CHEMICAL

United States

2,258,847. **Preparation of Metal Dithiocarbamates.** H. I. Cramer, Cuyahoga Falls, O.

2,259,122. **Composition Comprising a Stabilizer and a Heat Curable Plastic Polymer of Chloroprene** Having the Formula $CH_2=C-C=CH_2$ (X, R) in Which X Is Halogen and R Is a Member of the Group Consisting of Hydrogen and Hydrocarbon Radicals Obtained by Polymerizing the Chloroprene in the Presence of a Modifying Agent (Hydrogen Sulphide, Aliphatic Mercaptans, Aromatic Mercaptans or Mercapto Carboxylic Acids), the Stabilizer Containing the Nucleus $\left[\begin{matrix}\diagdown \\ \\ \diagup\end{matrix}(X)(S)\right]\equiv C-S-$. H. W. Walker, Woodstown, N. J., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

2,259,141. **Polyvinyl Halide Plasticized** with a Tetrahydrofurfuryl Ester of an Aliphatic Dibasic Acid of the Class $C_nH_{2n-2}O_4$ Where n Is at Least 6. J. J. Russell, Schenectady, N. Y., assignor to General Electric Co., a corporation of N. Y.

2,259,164. **Reacting Sulphur Monochloride and Amines.** P. C. Jones, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,259,167. **Cyanhydrin Interchange.** F. E. Kung, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,259,169. **Process Which Comprises Bringing a Fluid into Contact with a Synthetic Resin** Having Anion-Exchange Properties, Which Resin Results from Reacting a Polyalkylene Polyamine, an Aldehyde, and a Ketone, Whereby to Sorb Selectively from the Fluid a Desired Constituent. J. R. Little, Packanack Lake, N. J., assignor to United States Rubber Co., New York, N. Y.

2,259,175. **Preserving Rubber** by Incorporating Therein a Diarylamine Having an Aryl Group Directly Bonded to Oxygen Which Is Singly Bonded to Boron of a Boron-Containing Radical Derived from Boric Acid, the Aryl Group Having Its Nucleus Free of Substituent Hydroxyl Groups in the Positions Ortho to the Oxygen. P. T. Paul, Naugatuck, Conn., assignor, by mesne assignments, to United States Rubber Co., New York, N. Y.

2,259,180. **Polymerizing a Monomer** So Volatile That Its Vapor Pressure at the Temperature at Which the Polymerization Is Being Effected Exceeds Atmospheric Pressure. F. K. Schoenfeld and W. L. Semon, Silver Lake, O., assignors to B. F. Goodrich Co., New York, N. Y.

2,259,190. **Rubber-to-Metal Bonding Cement** Consisting of Rubber Chloride, a Volatile Solvent, Sulphur, and a Minor Amount of an Organic Accelerator for the Vulcanization of Rubber. H. A. Winkelmann, Chicago, Ill., and E. W. Moffett, Milwaukee, Wis., assignor to Marbon Corp., Gary, Ind.

2,259,195. **Production of Dehydrogenation Products** from Partially Chlorinated Aliphatic Hydrocarbons and Hydrogen Chloride by Contacting a Gaseous Reaction Mixture of Butane and Chlorine with a Solvent for the Hydrogen Chloride and Separating the Unsaturated Hydrocarbons Obtained Therefrom. H. Baehr and W. Deiters, Leuna, Germany, assignors, by mesne assignments, to Jasco, Inc., a corporation of La.

2,259,339. **Thin Film or Foil** Composed Essentially of Rubber Hydrochloride and Balata Hydrochloride. S. D. Gehman, Akron, O., assignor to Wingfoot Corp., Wilmington, Del.

2,259,353. **Accelerator**—Benzoselenazyl 2-Selenide Compounds. W. Scott, Akron, O., assignor to Wingfoot Corp., Wilmington, Del.

2,259,354. **Vulcanization of Rubber** in the Presence of a Compound Obtained by Reacting Formaldehyde, a Salt of a Primary Aromatic Amine, and a Compound Having the Formula  in Which R Is an Arylene Radical. W. Scott, Akron, O., assignor to Wingfoot Corp., Wilmington, Del.

2,259,356. **Making 2-Mercaptoarylenethiazoles** by Heating a Di(Arylenethiazyl) Disulphide in a Closed Vessel at about 150 to 300° C., in the Presence of Carbon Bisulphide, Sulphur, and an Amine Having a Free Ortho Position. C. H. Smith, Tallmadge, O., assignor to Wingfoot Corp., Wilmington, Del.

2,259,414. **Complex Diaryl Guanidine Metal Salt Addition Compounds.** A. R. Davis, Old Greenwich, Conn., assignor to American Cyanamid Co., New York, N. Y.

2,259,470. **Producing Rubber-Like, Condensation Products** by Heating a Mixture of Allyl Chloride and a Water-Soluble Polysulphide. H. Jacobi and W. Flemming, both of Ludwigshafen-on-the-Rhine, Germany.

2,259,496. **Polymerizing Soluble Polycyclopentadiene with Monomeric Styrene.** F. J. Soday, Upper Darby, Pa., assignor to United Gas Improvement Co., a corporation of Pa.

2,259,497. **Resinous Composition** Formed by the Polymerization of Soluble Polycyclopentadiene with Monomeric Ring-Substituted Methyl Styrene. F. J. Soday, Upper Darby, Pa., assignor to United Gas Improvement Co., a corporation of Pa.

2,259,671. **Producing a High Molecular Weight Uniformly Chlorinated Polymer of Isobutylene** by Saturating a Chlorinated Isobutylene Monomer with an Active Metal Halide Polymerization Catalyst and Polymerizing at around —80° F. V. Voorhees, Hammond, assignor to Standard Oil Co., Chicago, both in Ill.

2,259,695. **Preparation of Sulphur and Chlorine Containing Olefin Polymers** by Successively Halogenating and Sulphurizing the Olefin Polymer. C. M. Hull, assignor to Standard Oil Co., both of Chicago, Ill.

2,260,024. **Electrical Conductor Insulation** Comprising Fiber Glass Associated with a Composition Comprising a Superpolyamide Modified with a Synthetic Resin. R. W. Hall and H. A. Smith, both of Fort Wayne, Ind., assignors to General Electric Co., a corporation of N. Y.

2,260,295. **Plastic Composition** Comprising an Ester of a Lower Aliphatic Monohydroxy Acid Esterified with an Unsubstituted Dicarboxylic Acid Intimately Associated with a Vinyl Resin. T. F. Carruthers, South Charleston, and C. M. Blair, Charleston, both in W. Va., assignors to Carbide & Carbon Chemicals Corp., a corporation of N. Y.

2,260,367. **Increasing the Amenability to Dyeing of Substantially Solid Resinous Linear Condensation Polymers** (Polyamides Derived from a Diamine and a Dibasic Carboxylic Acid) by Subjecting the Polymer to the Action of an Aqueous Solution Containing Chlorite Ions. A. L. Dubeau, Lewiston, J. D. MacMahon, Niagara Falls, and G. P. Vincent, assignors to Mathieson Alkali Works, Inc., both of New York, all in N. Y.

2,260,380. **Accelerator** — Reaction Products of Formaldehyde and a Compound Having the Formula $R_1—S—CH_2—\underset{\displaystyle H}{\underset{|}{N}}—R_2$ Wherein R_1 Represents an Organic Radical Having the Free Valence on a Carbon Atom, and R_2 Represents a Hydrocarbon Group. P. C. Jones, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,260,410. **Transparent, Rubbery Sheet** Comprising 100 Parts of a Polyvinyl Acetal Resin (Predominatingly Butyraldehyde Acetal Groups) and at Least 40 Parts of Tributyl Citrate as an Elasticizer. H. B. Smith, assignor to Eastman Kodak Co., both of Rochester, N. Y.

2,260,475. **Preparation of Synthetic Rubber-Like Materials** Which Comprises Subjecting a Butadiene-1,3 to Copolymerization in Aqueous Emulsion with Other Polymerizable Compounds in the Presence of Tertiary Amines Soluble in at Least One of the Polymerizable Compounds. H. Marke, Leverkusen-Schlebusch, Germany, assignor, by mesne assignments, to Jasco, Inc., a corporation of La.

2,261,021. **Recovery of Halogens from Non-Alkaline Aqueous Solutions** by Subjecting the Solution to the Action of a Synthetic Resin. D. M. Findlay, Passaic, N. J., assignor, by mesnes assignments, to United States Rubber Co., New York, N. Y.

2,261,024. **Accelerator** — Reaction Product of a Salt of a Mercaptoarylthiazole and Monochloramine. R. S. Hanslick, New Haven, Conn., assignor to United States Rubber Co., New York, N. Y.

2,261,042. **Vulcanization of Rubber** Which Comprises Incorporating into the Rubber Mix, prior to Vulcanization, a Small Amount of a Compound of the Group Consisting of 2-Amino-Thiazolines and Their Salts of Weak Acids. I. Williams, Woodstown, N. J., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

2,261,313. **Process for Uniting Materials of Polymerized Vinylchloride with Wood, Leather, Etc.** K. Thinius and F. Loblein, both of Eilenburg, Germany, assignors, by mesne assignments, to W. H. Duisberg, New York, N. Y.

2,261,439. **Preparing Cellular Rubber** from Aqueous Dispersions of Rubber Carrying a Negative Charge on the Rubber Particles by Admixing the Dispersion with an Oil Stabilized Foam Having an Effective Positive Charge. J. H. Kelly, Jr., assignor to Dryden Rubber Co., both of Chicago, Ill.

2,261,611. **Heat Stabilized Vinyl Resin.** D. M. Young and W. M. Quattlebaum, Jr., both of Charleston, W. Va., assignors to Carbide & Carbon Chemicals Corp., a corporation of N. Y.

2,261,748. **Chlorinated Hydrocarbon Resin** Obtained by Polymerizing a Chlorinated Hydrocarbon (Cracked Petroleum Products, Etc.) by the Use of a Friedel-Crafts Type Catalyst. R. Waller, Helsingfors, and C. Gustafsson, Imatra, both in Finland, assignors to J. Bjorksten, Chicago, Ill.

2,261,757. **Dehalogenation of Halogenated Ethylene Polymers.** E. W. Fawcett, Northwich, England, assignor to Imperial Chemical Industries, Ltd., a corporation of Great Britain.

2,261,759. **Resinous Composition** Obtained by Reacting a Hydrocarbon Material (Cracked Petroleum Hydrocarbons or By-Products in Cracking Operations) with a Material Selected from the Group Consisting of Sulphur-Chloride Compounds and thereafter Polymerizing the Reaction Product. C. Gustafsson, Helsingfors, Finland, assignor to J. Bjorksten.

2,261,769. **Manufacturing a Rubber Article** by Irreversibly Gelling a Latex Composition Containing a Heat-Sensitizing Agent, Allowing the Gel to Synerize for at Least One Hour in an Aqueous Bath Having a pH below 5.5, and Further Drying the Gel by Evaporating the Water. H. F. Jordan, Nutley, N. J., assignor to United States Rubber Co., New York, N. Y.

2,261,790. **Making a Rubber Article** by Irreversibly Gelling a Latex Composition Containing a Heat-Sensitizing Agent, Allowing the Gel to Synerize, Treating after Syneresis with an Aqueous Solution Having a pH above 9, and Further Drying the Gel by Evaporation. B. W. Bender, Wanaque, N. J., assignor to United States Rubber Co., New York, N. Y.

2,262,092. **Paint,** Resistant to Water, Oils, and Chemicals, Comprising Polymerized Chloroprene and Chlorinated Rubber in an Organic Solvent. M. R. Buffington, Millburn, N. J.

2,262,398. **Organic Vulcanizing Agent**—Splitting a Sulphur-Sulphur Bond in a Thiazyl Polysulphide with a Solution of Sulphur in a Functionally Aliphatic Primary Amine, and Eliminating from the Reaction Mixture the Thiazyl Ammonium Sulphide Formed. P. C. Jones, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,262,481. **Accelerator** — 2-Mercaptothiazoline in Which the Hydrogen of the Mercaptan Group Has Been Substituted by an Organic Radical More Strongly Electron Attracting Than the Ortho-Tolyl Radical, Which Organic Radical Is Connected to the Thiazolinyl Radical by Means of a Covalent Bond between a Carbon Atom of the Organic Radical and the Mercapto Sulphur Atom of the Thiazolinyl Radical. I. Williams, Borger, Tex., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

Dominion of Canada

399,945. **Preparation of a Copolymer of Vinylidene Chloride and an Allyl, 2-Methyl-Allyl, 2-Chloroallyl, Crotonyl, or Cinnamyl Ester of a Mono- or Di-Carboxyl Acid.** Dow Chemical Co., assignee of E. C. Britton, C. W. Davis, and F. L. Taylor, co-inventors, all of Midland, Mich., U. S. A.

399,946. **Copolymer of Vinylidene Chloride and Divinyl Ether.** Dow Chemical Co., assignee of E. C. Britton and C. W. Davis, co-inventors, all of Midland, Mich., U. S. A.

399,947. **Copolymers of Vinylidene Chloride and at Least one of the Lower Alkyl Esters of at Least One of the Acids, Acrylic Acid and Methacrylic Acid.** Dow Chemical Co., assignee of R. M. Wiley, both of Midland, Mich., U. S. A.

400,099. **Process Which Comprises Emulsifying Chloro-2-Butadiene-1,3** in an Aqueous Medium and Then Polymerizing the Dispersed Compound in the Presence of Sulphur. Canadian Industries, Ltd., Montreal, P. Q., assignee of A. M. Collins, Wilmington, Del., U. S. A.

400,100. **Making Plastic, Rubber-Like Materials** by Polymerizing Chloro-2-Butadiene-1,3 in the Presence of Sulphur, Plasticizing the Polymerized Material, and Then Adding a Tetra Alkyl Thiuram Disulphide and a Diarylguanidine. Canadian Industries, Ltd., Montreal, P. Q., assignee of M. A. Youker, Wilmington, Del., U. S. A.

400,106. **Making Plastic, Rubber-Like Materials** by Polymerizing Butadiene-1,3 in the Presence of Sulphur, Plasticizing the Polymerized Material, and Adding to the Polymerized Material a Dithiocarbamate, a Mercaptan, or a Tetra Alkyl Thiuram Disulphide and a Diarylguanidine. Canadian Industries, Ltd., Montreal, P. Q., assignee of H. W. Starkweather and M. A. Youker, co-inventors, both of Wilmington, Del., U. S. A.

400,108. **Making Plastic, Rubber-Like Materials** by Polymerizing Butadiene, in Aqueous Emulsion, in the Presence of Sulphur, Plasticizing the Polymerized Material, and Adding to the Polymerized Material at Least One Compound of the General Formula R—S—R_1, in Which R Is a Xanthogenyl or Thioanthogenyl Group, and R_1 Is Hydrogen, a Base-Forming Radical, or a Radical Represented by—S_n—R_2 in Which n Is a Whole Number Less Than 4 and R_2 Is One of the Groups Represented by R Above. Canadian Industries, Ltd., Montreal, P. Q., assignee of H. W. Starkweather, Wilmington, and M. A. Youker, Gordon Heights, co-inventors, both in Del., U. S. A.

400,244. **Composition Comprising a Heat Curable Plastic Polymer** of a Compound of the General Formula $CH_2{=}C{-}C{=}CH_2$ in Which R (with X R above it)

Is Hydrogen or a Hydrocarbon Radical, and X Is Halogen, Having in Chemical Combination Therewith an Unpolymerizable, Acid-Stable Organic Modifying Agent Capable of Forming an Addition Product with Compounds of the above General Formula under Conditions of Polymerization, and Also Comprising a Small Amount of a Mercaptan. E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., assignee of H. W. Walker, Carneys Point, N. J., both in the U. S. A.

400,252. **Producing a Rubber-Like Mass** by Agitating a Cracked Petroleum Distillate Containing Potential Gum-Forming Compounds with an Electrolyzed Aqueous Solution Substantially Equivalent to 20% Sulphuric Acid and Simultaneously Reacting with Chlorine. Hultene Rubber Corp., New York, assignee of E. W. Hultman, Larchmont, both in N. Y., U. S. A.

400,428. **Hard Rubber Article** Having a Strongly Adherent and Resistant Rubber-Free Surface Coating Comprising a Vinyl Resin Resulting from the Conjoint Polymerization of Vinyl Chloride and Vinyl Acetate, together with a Compound of Lead to Prevent Decomposition of the Resin, the Coating Being Bonded to the Hard Rubber Surface by Baking at above 275° F. Carbide & Carbon Chemicals, Ltd., Toronto, Ont., assignee of A. K. Doolittle, South Charleston, W. Va., U. S. A.

400,441. **Producing Vulcanized Rubber Articles of Reduced Combustibility** by Impregnating Vulcanized Sponge Rubber with a Solution of a Substance Which, When Heated, Gives a Residue Selected from Boric Acid, Phosphoric Acid, and easily Fusible Heat Resistant Compounds of Boric Acid, Phosphoric Acid, and Sulphuric Acid and Drying the Impregnated Material. Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ont., assignee of D. F. Twiss and I. Kemp, both of Birmingham, Warwickshire, and F. W. Warren, Manchester, Lancaster, co-inventors, both in England.

400,529. **Preparing Copolymers from a Butadiene and Another Monomer Containing an Ethylenic Linkage** by Heating a Mixture of the Two Monomers in the Presence of Sodium Perborate, an Emulsifying Agent, and a Chloropropionitrile. Wingfoot Corp., Wilmington, Del., assignee of J. G. Lichty, Stow, O., both in the U. S. A.

United Kingdom

539,442. **Artificial Filaments, Films, Sponges, and Similar Structures.** E. I. du Pont de Nemours & Co., Inc.

539,476. **Preparation of Aqueous Dispersions of Highly-Polymerized Organic Substances.** G. W. Johnson, (I. G. Farbenindustrie, A.G.).

539,489. **Chlorinated Rubber.** D. E. Woods, H. Dodd, and Imperial Chemical Industries, Ltd.

539,493. **Vulcanization of Rubber.** Monsanto Chemical Co.

539,585. **Treating Metal and Other Surfaces and Bonding Rubber or the Like thereto.** Dunlop Rubber Co., Ltd., E. A. Murphy, and S. G. Ball.

539,605. **Artificial Dispersions of Rubber.** Dispersions Process, Inc.

539,606. **Accelerators.** United States Rubber Co.

539,641. **Rubber Transformation Products.** Albert Products, Ltd., and S. R. W. Martin.

539,732. **Preparation of Softened Rubber.** British Rubber Producers' Research Assn. and J. Stokes.

539,834. **Compositions Appreciably Oil-Resistant.** H. G. C. Fairweather, (B. F. Goodrich Co.).

UNCLASSIFIED

United States

2,259,022. **Triple Unit Vehicle Wheel.** C. W. Clark, Meridan, Miss., and W. P. Edmonds, Emelle, Ala.

2,259,917. **Holder** for Skein and Strand Material. L. A. Wiggins, Akron, and R. Patterson, Cuyahoga Falls, both in O., assignors to B. F. Goodrich Co., New York, N. Y.

2,260,020. **Knitting Machine** with Elastic Yarn Feeding Means. I. H. C. Green, Central Falls, and E. St. Pierre, Pawtucket, assignors to Hemphill Co., Central Falls, all in R. I.

2,260,205. **Closely Coiled Annular Wire Member** for Insertion into a Tire Casing for Resiliently Holding It in Formation. A. Bayer and G. A. Manning, both of New York, N. Y.

2,260,648. **Tire Pressure Signaling System.** J. B. Testori, Detroit, Mich.

2,261,280. **Advertising and Display Device** for Inner Tubes. W. B. Pennebaker, Scarsdale, J. V. Cherry, New City, assignors to United States Rubber Co., New York, all in N. Y.

2,261,314. **Holder** for Eraser, Pencil, Etc. M. Vogel, Bridgeport, Conn.

2,261,319. **Production of Acetylene and Carbon Black** by the Pyrolysis of Hydrocarbon Gases and Vapors. W. D. Wilcox, Kansas City, Mo.; M. P. Wilcox, executrix of W. D. Wilcox, deceased, assignor to L. J. Snyder, Kansas City, Mo., J. V. Richards, Pekin, Ill., and H. M. Wilcox, Santa Monica, Calif., as trustees.

2,261,668. **Hydraulically Operated Brake Mechanism.** F. J. Tarris and D. Webb, assignors to India-Rubber, Gutta Percha & Telegraph Works Co., Ltd., all of London, England.

2,262,349. **Tire Road Grip.** R. H. Webster, Providence, R. I.

United Kingdom

539,665. **Method of and Apparatus for Reenforcing Protuberances on Metallic Members.** Firestone Tire & Rubber Co., Ltd.

539,905. **Wheels for Aircraft and Other Vehicles.** Dunlop Rubber Co., Ltd., and G. H. Whale.

TRADE MARKS

United States

390,766. **A nature skin that molds you in.** Girdles. International Latex Corp., Dover, Del.

390,785. **Grip-Tex.** Gloves. Pioneer Rubber Co., Willard, O.

390,792. **Aladdin.** Synthetic rubber, rubber substitutes, and rubber-like materials. Standard Oil Development Co., Linden, N. J.

390,832. Representation of an Indian's head superimposed on a black bar containing the words: **"Cre Art"** in white. Erasers, rubber bands, etc. American Reedcraft Corp., New York, N. Y.

390,880. **Summer-Sured.** Picnic vacuum jugs. Firestone Tire & Rubber Co., Akron, O.

390,916. **Texbord.** Latex adhesives and dispersion fluid. Celotex Corp., Chicago, Ill.

391,007. **Slip-on.** Dress shields. I. B. Kleinert Rubber Co., New York, N. Y.

391,009. **Pin-eyelet.** Dress shields. I. B. Kleinert Rubber Co., New York, N. Y.

391,030. **Safety For Sale! O'Toole.** Tires. O'Toole-General Tire Co., Baltimore, Md.

391,100. Representation of a label containing the letters: **"BFG"** and **"1870"**, and a laurel wreath. Heels and soles. B. F. Goodrich Co., New York, N. Y.

391,109. **Flents Anti-Noise Ear Stopples.** Ear plugs. Flents Products Co., Inc., New York.

391,113. **Headliner.** Shower curtains and window drapes. Para Mfg. Co., Inc., Newark, N. J.

391,119. **C D.** Tires. General Tire & Rubber Co., Akron, O.

391,123. **Pan American.** Tires and tubes. Goodyear Tire & Rubber Co., Akron, O.

Market Reviews

CRUDE RUBBER

Commodity Exchange

TABULATED WEEK-END CLOSING PRICES ON THE NEW YORK MARKET

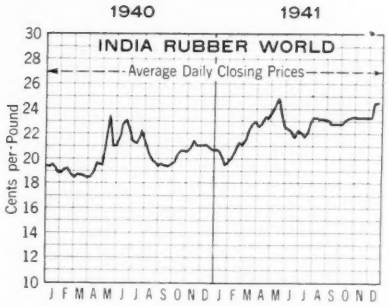
Futures	Oct. 25	Nov. 29	Dec. 6	Dec. 13	Dec. 20	Dec. 27
Dec.	22.50	22.50	22.50	22.50	22.50	22.50
Jan.	22.35	22.35	22.35	.....	.....	.....
Mar.	22.35	22.35	22.35	22.50	22.50	22.50
Volume per week (tons)	80	50	10	10	.....	80

THE rubber futures market remained dull and generally stagnant last month, with activity virtually at a standstill the week of December 14 as a result of the effect of the strict rationing program and prohibition from December 11 to January 4 of new tires sales. The December 1 closing price of 22.35¢ per pound on March futures advanced to 22.50¢ per pound December 8 and remained at that figure to December 30. There were 42 open contracts on December 29 as compared with 61 on December 1.

World stocks at the end of September were 882,145 long tons, the Commodity Exchange, Inc., reported. The major portion of the 43,000 long tons increase over August was attributed to the increase of United States stocks and in supplies afloat to other countries. Rubber exports from British Malaya under the regulation scheme in October (the first month of the 120% permissible quotas) was 12,100 long tons below the permissible volume of 64,800 long tons.

Although signatory countries were finding it difficult to export permissible tonnage, the International Rubber Regulations Committee decided on December 2, 1941, to maintain for the first quarter of 1942 the 120% quotas then in effect. It was agreed, however, to permit no new planting in 1942 or 1943, except a small acreage for experimental purposes. The permissible rubber shipments from countries participating in the restriction scheme (except Thailand and Indo-China) for the first quarter of 1942 will amount to 452,000 long tons compared with 449,700 long tons in the last quarter of 1941. It is believed in some circles that appreciable quantities of rubber will be able to escape a possible Japanese blockade after the battle situation in the Pacific is to some extent clarified.

The rubber industry is reportedly reconciled to the fact that war in the Pacific will curtail operations to a large extent. Just how much rubber will be available for allocation for civilian products under the strict rationing order of the Office of Production Management is at the present time unknown by the trade. Many rubber manufacturers are seeking defense contracts in order to maintain current plant production or trying to adapt existing equipment for making defense products from other materials than rubber.



New York Outside Market—Spot No. 1-X Ribbed Smoked Sheets

Fixed Government Prices*

Plantation Grades	Price Per Lb. Dec. 1-Dec. 24
No. 1-X R.S.S. in cases†	$0.22½
No. 1 Thin Latex Crepe	.23⅛
No. 2 Thick Latex Crepe	.23⅛
No. 1 Brown Crepe	.21⅜
No. 2 Brown Crepe	.21⅛
No. 2 Amber	.21⅜
No. 3 Amber	.21⅛
Rolled Brown	.17⅛

* For a complete list of government prices see our October 1, 1941, issue, p. 58.

† Free rubber on New York Outside Market: Dec. 1-Dec. 6, 23¼¢; Dec. 8, 24¢; Dec. 9-Dec. 24, 24½¢.

New York Outside Market Rubber Quotations

Latex	Dec. 30, 1940	Nov. 28, 1941	Dec. 29, 1941
	(Dollars and Cents)		
Normal and concentrated (solid content) ....lb.	.2468/.25	.2825/.295	.2825/.295
Paras			
Upriver fine....lb.	.16½	.28½	.32½
Upriver fine....lb	*.19¾	*.32½	*.37
Upriver coarse..lb	.11½	.16	.17
Upriver coarse..lb	*.16⅞	*.23	*.23
Islands fine....lb.	.16	.28½	.31
Islands fine....lb.	*.19¼	*.32	*.36
Acre, Bolivian fine .....lb.	.16¾	.29	.33
Acre, Bolivian fine .....lb.	*.19⅞	*.33	*.37
Beni, Bolivian fine .....lb.	.18	.30	.34
Madeira fine...lb.	.16½	.28½	.32½
Caucho			
Upper ball.....lb.	.11½	.16	.17
Upper ball.....lb.	*.16¾	*.23	*.23
Lower ball.....lb.	.10½	.15	.16
Pontianak			
Pressed block..lb.	16/.25	.22/.30	....
Guayule			
Ampar .....lb.	.15½	....	....
Africans			
Rio Nuñez ..lb.	.18½	.18	.20
Black Kassai...lb.	.19	.18	.20
Prime Niger flake .....lb.	.22½	.28	.28
Gutta Percha			
Gutta Siak ....lb.	.16½/17½	.24	....
Gutta Soh .....lb.	.27	.30	....
Red Macassar..lb.	1.20	1.35	1.50
Balata			
Block Ciudad Bolivar .....lb.	.42	.44	....
Manaos block..lb.	.45	.45	....
Surinam sheets..lb.	.54	.45	....
Amber .....lb.	.56	.47	....

* Washed and dried crepe. Shipments from Brazil.

The Rubber Manufacturers Association, Inc., has announced, that in the interests of a country at war, it will not make public until further notice statistics on United States consumption, stocks, imports, or crude rubber afloat to our shores.

New York Outside Market

The free rubber market was generally dull and inactive throughout the month. Only early in the second week was there active bidding for the small available supplies which were largely held for better offers expected later. No. 1-X ribbed smoked sheets closed at 23¼¢ per pound November 29, rose to 24¢ per pound December 8, to 24½¢ per pound on December 9, and closed at 24½¢ per pound December 30.

RUBBER SCRAP

DECEMBER demand for rubber scrap held to the high levels of November as a result of continued heavy reclaim production. Dealers were active in the collection field and were making reportedly intensive canvasses in outlying districts. The Department of Commerce reported that United States scrap rubber imports in September totaled 1,890,347 pounds, of which 1,240,695 pounds were from the Dominion of Canada.

A telegraphic request on December 11 from the OPA asked dealers to make no price advances on scrap rubber above those in effect December 5. Prices quoted here are in some cases slightly above those quoted a month ago and may reflect price increases prior to the OPA notification.

Consumers Buying Prices

(Carlot Lots for December 26, 1941)

	Prices
Boots and Shoes	
Boots and shoes, black.....lb.	$0.01½/$0.01⅝
Colored .....lb.	.01¼/ .01⅜
Untrimmed arctics .....lb.	.01¼/ .01⅜
Inner Tubes	
No. 1, floating .....lb.	.12 / .14
No. 2, compound .....lb.	.07⅞/ .08
Red .....lb.	.07¾/ .08
Mixed tubes .....lb.	.06⅜/ .06⅝
Tires (Akron District)	
Pneumatic Standard	
Mixed auto tires with beads .....ton	17.00/ 18.00
Beadless .....ton	24.50 /25.00
Auto tire carcass .....ton	55.00 /57.50
Black auto peelings.....ton	54.00 /55.00
Solid	
Clean mixed truck .....ton	43.00 /46.00
Light gravity .....ton	50.00 /52.00
Mechanicals	
Mixed black scrap.....ton	31.00 /32.00
Hose, air brake .....ton	32.00 /34.00
Garden, rubber covered..ton	12.00 /14.00
Steam and water, soft...ton	12.00 /14.00
No. 1 red.....lb.	.05 / .05¼
No. 2 red.....lb.	.03¼/ .04
White druggists' sundries...lb.	.04¾/ .05
Mixed mechanicals .....lb.	.02½/ .02¾
White mechanicals .....lb.	.04¾/ .05
Hard Rubber	
No. 1 hard rubber.....lb.	.16 / .17

RECLAIMED RUBBER

THE demand for reclaimed rubber continued heavy during December, but the market experienced, as a result of the sharp government curtailment of crude rubber consumption for civilian products, some shifting in the origin of demands. The OPM has, as yet, placed no restrictions on the use of reclaimed rubber, and two major tire manufacturers have announced production of tires made entirely of reclaim. The R. M. A. reports that, until further notice, it will not make public reclaim stocks, production, and consumption statistics.

The OPA announced December 17 ceiling prices for reclaimed rubber, effective December 20, at levels prevailing between November 5 and December 5 (see page 390). All persons selling reclaimed rubber are required to file with the OPA, prior to January 15, price lists and records of prices actually received during the period November 5 to December 5. Prices quoted here are unchanged from last month.

New York Quotations

December 29, 1941

	Sp. Grav.	¢ per lb.
Auto Tire		
Black Select	1.16-1.18	6½/ 6¾
Acid	1.18-1.22	7½/ 7¾
Shoe		
Standard	1.56-1.60	7 / 7⅛
Tubes		
Black	1.14-1.26	11¼/11½
Gray	1.15-1.26	12½/13¼
Red	1.15-1.30	12 /12½
Miscellaneous		
Mechanical blends	1.25-1.50	4½/ 5½
White	1.35-1.50	13½/14½

The above list includes those items or classes only that determine the price bases of all derivative reclaim grades. Every manufacturer produces a variety of special reclaims in each general group separately featuring characteristic properties of quality, workability, and gravity at special prices.

Sander

(*Continued from page 386*)

moves grit and dust from the air before entering the motor, and a fan (mounted on the motor shaft) and baffle plate which increase the flow of air through the motor to insure adequate cooling. A new-type motor filter cap makes the motor, filter, and switch easily accessible. Precision balancing and redesigned handle mountings are said to reduce vibration to a minimum. An interchangeable front handle can be shifted from the front to a side position for precision work with one hand against vertical surfaces, at right angles, and in close corners. Detroit Surfacing Machine Co.

Tire Production Statistics

	Pneumatic Casings		
	Inventory	Production	Shipments
1939	8,664,505	57,612,731	57,508,775
1940	9,126,528	59,186,423	58,774,437
1941			
Jan.	9,797,253	5,486,296	4,849,748
Feb.	10,028,803	5,161,267	4,896,340
Mar.	10,148,861	5,685,559	5,517,255
Apr.	9,957,849	5,839,332	5,999,262
May	8,373,324	6,091,395	7,675,828
June	7,087,737	6,378,844	7,601,993
July	6,234,749	5,577,805	6,449,606
Aug.	5,834,109	4,983,424	5,394,340
Sept.	5,154,081	4,562,972	5,259,225
Oct.	4,122,836	4,834,308	5,867,175
Nov.	4,042,995	3,964,067	4,047,913

	Pneumatic Casings		
	Original Equipment	Replacement Sales	Export Sales
1939	18,207,556	38,022,034	1,279,185
1940	22,252,869	35,345,656	1,175,912
1941			
Jan.	2,291,209	2,424,730	133,809
Feb.	2,546,120	2,203,297	146,923
Mar.	2,638,066	2,728,557	150,632
Apr.	2,332,427	3,534,323	132,512
May	2,698,799	4,830,449	146,586
June	2,595,259	4,861,281	145,453
July	1,998,436	4,313,042	138,128
Aug.	1,122,227	4,142,407	129,706
Sept.	1,469,223	3,664,310	125,692
Oct.	1,994,383	3,756,963	115,820
Nov.	1,803,558	2,161,845	82,510

	Inner Tubes		
	Inventory	Production	Shipments
1939	7,035,671	50,648,556	51,190,314
1940	7,016,948	52,237,003	52,214,079
1941			
Jan.	7,632,655	5,112,824	4,473,942
Feb.	7,924,383	4,887,190	4,610,313
Mar.	8,068,646	5,349,202	5,181,168
Apr.	8,142,692	5,480,933	5,358,351
May	7,686,194	5,839,405	6,310,202
June	7,010,100	6,263,876	6,908,434
July	6,356,726	5,278,207	5,916,587
Aug.	6,071,075	4,435,690	4,779,735
Sept.	5,430,556	4,143,303	4,792,126
Oct.	4,447,558	4,137,200	5,143,304
Nov.	4,377,171	3,724,790	3,824,665

	Inner Tubes		
	Original Equipment	Replacement Sales	Export Sales
1939	18,190,630	31,997,906	1,001,778
1940	22,172,452	29,069,547	972,080
1941			
Jan.	2,281,274	2,082,311	110,357
Feb.	2,545,877	1,932,703	131,733
Mar.	2,647,533	2,405,927	127,738
Apr.	2,334,612	2,908,490	115,249
May	2,686,450	3,496,860	126,892
June	2,590,029	4,205,944	112,461
July	2,004,778	3,804,770	107,039
Aug.	1,114,325	3,552,979	112,431
Sept.	1,459,060	3,235,382	97,684
Oct.	1,982,061	3,072,028	89,215
Nov.	1,784,998	1,976,792	62,875

Source: The Rubber Manufacturers Association, Inc. Figures adjusted to represent 100% of the industry.

United States and World Statistics of Rubber Imports, Exports, Consumption, and Stocks—Long Tons

Twelve Months	U.S. Imports*	U.S. Consumption¶	U.S. Stocks Mfrs., Dealers, Importers, Etc.†¶	U.S. Stocks Afloat	U.K.—Public Warehouses London, Liverpool†‡	Singapore and Penang Dealers and Port Stocks†‡	World Net Exports‡	World Absorption‡c	World Stocks†‡§
1939	499,616	592,000	125,800	91,095	44,917a	15,299	988,600	1,112,383	447,666a
1940	818,624	648,500	288,864	145,950	.....	26,753	1,391,476	1,100,644	.....
1941									
Jan.	86,833	65,989	309,411b	153,169b	.....	37,145	151,005	101,832	.....
Feb.	73,973	62,692	320,372b	136,955b	.....	46,888	97,548	91,019	.....
Mar.	87,123	69,024	338,147b	140,228b	.....	41,005	130,523	104,293	.....
Apr.	63,305	71,374	329,767b	153,484b	.....	42,065	120,735	104,222	.....
May	101,404	71,365	359,234b	147,454b	.....	44,593	123,430	99,514	.....
June	64,577	84,912	339,108b	175,499b	.....	43,248	125,047	115,268	.....
July	97,081	68,653	395,216b	132,304b	.....	41,523	131,253	106,447	.....
Aug.	106,539	55,365	446,008b	90,591b	.....	44,920	131,731	97,115	.....
Sept.	83,151	53,655	473,684b	141,756b	.....	32,997	148,520	109,405	.....
Oct.	72,222	60,418	454,711b	172,633b	.....	48,399	133,906	114,168	.....

*Including liquid latex. †Stocks on hand the last of the month or year. ‡*Statistical Bulletin of the International Rubber Regulation Committee.* §Stocks at U. S. A., U. K., Singapore and Penang, Para, Manaos, regulated areas, and afloat. ¶Corrected to 100% from estimate of reported coverage. aStocks as of Aug. 31, 1939. bIncludes government emergency rubber. cIncluding producing countries.

World Net Imports of Crude Rubber—Long Tons

Year	U.S.A.	U.K.†	Argentine	Australia	Belgium	Canada	France	Greater Germany‡	Italy	Japan	Poland	Sweden	U.S.S.R.	Rest of World	Total
1938	406,300	168,172	7,700	12,300	11,300	25,700	58,100	107,900	28,200	46,300	7,900	8,300	26,800	49,200	928,000
1939	486,348	112,249¶	9,600	15,400	9,600	32,500	33,751§	62,344§	12,582§	42,300	5,415§	7,965a	14,000*	61,866	603,842¶
1940	811,564	....	10,019	19,044	1,585b	52,567	....	....	....	30,847c	....	....	....	....	....
1941															
Jan.	86,541	....	706	1,065	....	6,290	....	....	....	....	....	....	....	....	....
Feb.	73,646	....	362	1,717	....	3,770	....	....	....	....	....	....	....	....	....
Mar.	86,794	....	975	3,486	....	3,879	....	....	....	....	....	....	....	....	....
Apr.	64,521	....	328	2,326	....	2,531	....	....	....	....	....	....	....	....	....
May	101,034	....	376	1,549	....	5,596	....	....	....	....	....	....	....	....	....
June	64,101	....	1,000	1,373	....	2,818	....	....	....	....	....	....	....	....	....
July	96,658	....	1,684	2,003	....	4,143	....	....	....	....	....	....	....	....	....
Aug.	93,256	....	659	1,251	....	10,683	....	....	....	....	....	....	....	....	....
Sept.	81,500*	....	....	4,392	....	17,095	....	....	....	....	....	....	....	....	....
Oct.	72,000*	....	....	....	....	4,423	....	....	....	....	....	....	....	....	....

*Estimated. †U. K. figures show gross imports, not net imports. ‡Including imports of Austria and Czechoslovakia. ¶Up to Aug. 31, 1939, only. §Up to July 31, 1939, only. aUp to September 30, 1939. bJan.-Feb. cJan.-Aug. Source: *Statistical Bulletin of the International Rubber Regulation Committee.*

COMPOUNDING INGREDIENTS

THE compounding ingredients market continued to meet, through allocations, the generally heavy demands of the trade in December. Movements were usually large although the supply of some types of materials remained tight. Some ingredients are affected by price increases; while others remain steady and unchanged. It is believed that the rubber rationing program may affect domestic consumption of many compounding materials, but its total effect upon the market cannot yet be determined.

CARBON BLACK. It was estimated that shipments of carbon black rose by some six million pounds in November; while stocks declined about eight million pounds. Lend-lease shipments accounted for a large share of the increased business. Gas black manufacturers expect a reduction in domestic non-defense sales as a result of the sharp curtailment in civilian rubber production. Sudden strong demand for blackout materials will increase demand to only a small extent, many producers believe. Current stocks, estimated at 20 million pounds, are termed adequate owing to greatly reduced tire production. On deliveries after January 1 producers are permitted to increase prices slightly less than 5% above mid-December quotations to 3.30c per pound in bulk, and 3.55c per pound in bags, compressed or dustless (f.o.b. plant) by OPA order.

CLAY. Movements were large in both imported and domestic stocks. Prices have increased.

FACTICE OR RUBBER SUBSTITUTE. The Materials Division, OPM, has ordered that rapeseed oil may not be shipped or used except on sworn statement that such shipment or use is essential for defense orders as defined under Priority Regulation No. 1. A further provision provides that no rapeseed oil may be shipped against defense orders rated under General Preference Order No. P-22. The demand for rubber substitutes is heavy. Although the cost of vegetable oils is increasing, prices are generally firm.

LITHARGE. Supplies are adequate for normal needs. Inquiries were active in a stable market with considerable movement to production. Prices are firm.

LITHOPONE. The Bureau of the Census reported a 1939 barite production of 348,000 short tons, value $2,065,000. Missouri, Georgia, and Tennessee mined 80% of the total, and much of the output of the 47 mines engaged in the industry was used in the manufacture of lithopone. Consumption of lithopone was at a high level, and manufacturers allocated December supplies to meet urgent needs. There were few spot offerings. Prices are firm and unchanged.

RUBBER CHEMICALS. Demand held to November levels. It is believed that the use of high-grade rubber for defense products and an increase in the use of reclaimed rubber account for the continued large demand in December for accelerators and antioxidants, but some lessening in demand is expected in 1942 due to the severe rubber restriction orders. Prices are generally unchanged.

RUBBER SOLVENTS. The December demand increased over the preceeding month with heavy shipments to the tire industry and other consuming industries. Prices are steady and unchanged.

TITANIUM PIGMENTS. Under General Preference Order M-44, effective January 1, the January pool requirements for titanium dioxide have been set at 29% of each producer's daily average production. Large amounts of titanium pigments moved into consumption on manufacturers' allocations during December. There are slight and varying fractional increases in January prices.

ZINC OXIDE. Supplementary Order No. M-11-f, Division of Priorities, OPM, issued December 3, 1941, ordered that no zinc oxide need be stored for the defense pool until further notice. Prices have risen to meet the new ceilings effective January 1, which include a price of 7¼c a pound for lead free, American process, in bags in carload lots.

Current Quotations*

Abrasives

Pumicestone, powdered	lb.	$0.0375	/$0.04
Rottenstone, domestic	lb.	.025	/ .03

Accelerators, Inorganic

Lime, hydrated, *l.c.l.*, New York	ton	25.00	
Litharge (commercial)	lb.	.0825	
Magnesia, calcined, heavy	lb.		
technical	lb.	.0625/	.07

Accelerators, Organic

A-1	lb.	.26	/ .35
A-10	lb.	.34	/ .40
A-19	lb.	.52	/ .65
A-32	lb.	.70	/ .80
A-77	lb.	.42	/ .55
A-100	lb.	.42	/ .55
Accelerator 49	lb.		
531	lb.	.48	/ .50
737	lb.	.42	/ .43
737-50	lb.	.25	/ .26
808	lb.	.70	/ .72
833	lb.	1.15	
Acrin	lb.	.60	
Aldehyde ammonia	lb.	.65	/ .70
Altax	lb.	.55	/ .60
B-J-F	lb.	.50	/ .55
Beutene	lb.	.70	/ .75
Butyl Eight	lb.	.98	/ 1.00
C-P-B	lb.	2.00	
Captax	lb.	.50	
Crylene	lb.		
Paste	lb.		
D-B-A	lb.	2.00	
Delac A	lb.	.40	/ .50
O	lb.	.40	/ .50
P	lb.	.40	/ .50
Di-Esterex-N	lb.	.60	/ .70
DOTG (Di-ortho-tolyguanidine)	lb.		
DPG (Diphenylguanidine)	lb.		
El-Sixty	lb.	.50	/ .65
Ethylideneaniline	lb.	.42	/ .43
Formaldehyde P.A.C	lb.	.06	/ .0625
Formaldehyde-para-toluidine	lb.	.57	/ .59
Formaniline	lb.	.36	/ .37
Guantal	lb.	.40	/ .50
Henteen	lb.	.35	/ .40
Base	lb.	1.35-	/ 1.50
Hexamethylenetetramine			
U.S.P.	lb.	.39	
Technical	lb.	.33	
Lead oleate, No. 999	lb.	.145	
Witco	lb.	.15	
Ledate	lb.	1.50	
Monex	lb.	1.55	
Novex	lb.		
O-X-A-F	lb.	$0.50	/$0.55
Oxynone	lb.	.77	/ .90
Para-nitroso-dimethylaniline	lb.	.85	
Pentex	lb.	.75	/ .85
Flour	lb.	.125	/ .135
O	lb.		
Flour	lb.		
Phenex	lb.	.50	/ .55
Pip-Pip	lb.	1.90	
R & H 50-D	lb.	.42	/ .43
Rotax	lb.	.60	/ .65
Safex	lb.	1.20	/ 1.30
Santocure	lb.	.80	/ 1.00
Selenac	lb.	2.00	
SPDX	lb.	.70	/ .75
A	lb.	.70	/ .75
Super sulphur No. 2	lb.	.14	/ .16
Tetrone A	lb.	2.20	
Thiocarbanilide	lb.	.26	/ .35
Thionex	lb.	1.55	
Thiurad	lb.	1.55	
Trimene	lb.	.55	/ .65
Base	lb.	1.05	/ 1.20
Triphenylguanidine (TPG)	lb.	.45	
Tuads, Methyl	lb.	1.55	
2-MT	lb.	.75	
Ulto	lb.	1.00	/ 1.05
Ureka	lb.	.60	/ .75
Blend B	lb.	.60	/ .75
C	lb.	.56	/ .65
Vulcanex	lb.	.42	/ .43
Vulcanol	lb.	.85	
Z-B-X	lb.	2.50	
Zenite	lb.	.46	/ .48
A	lb.	.53	/ .55
B	lb.	.46	/ .48
Zimate, Butyl	lb.	1.15	
Ethyl	lb.	1.15	
Methyl	lb.	1.25	
Zipacel	lb.	1.90	

Activators

Aero Ac 50	lb.		
Barak	lb.	.50	
MODX	lb.	.30	/ .35
SL No. 20	lb.	.085	/ .10

Age Resisters

AgeRite Alba	lb.	2.00	
Gel	lb.	.57	/ .59
Hipar	lb	.65	/ .67
Powder	lb.	.52	/ .54
Resin	lb.	.52	/ .54
D	lb.	.52	/ .54
White	lb.	1.25	/ 1.40
Akroflex C	lb.	.56	/ .58
Albasan	lb.	.70	/ .75
Aminox	lb.	.52	/ .61
Antox	lb.	.56	
Betanox	lb.	.52	/ .61
Special	lb.	.65	/ .74
B-L-E	lb.	.52	/ .61
Powder	lb.	.65	/ .74
B-X-A	lb.	.52	/ .61
Copper Inhibitor X-872-A	lb.	1.15	
Flectol B	lb.	.52	/ .65
H	lb.	.52	/ .65
White	lb.	.90	/ 1.15
M-U-F	lb.	1.50	
Neozone (standard)	lb.	.63	
A	lb.	.52	/ .54
B	lb.	.63	
C	lb.	.52	/ .54
D	lb.	.52	/ .54
E	lb.	.63	
Oxynone	lb.	.77	/ .90
Parazone	lb.	.68	
Permalux	lb.	1.20	
Santoflex B	lb.	.52	/ .65
BX	lb.	.58	/ .71
Santovar A	lb.	1.15	/ 1.40
Solux	lb.	1.30	
Stabilite	lb.	.52	/ .54
Alba	lb.	.70	/ .75
Thermoflex	lb.	1.20	/ 1.15
A	lb.	.65	/ .67
Tysonite	lb.	.16	/ .165
V-G-B	lb.	.52	/ .61

Alkalies

Caustic soda, flake, Columbia (400-*lb. drums*)	100 lbs.	2.70	/ 3.55
liquid, 50%	100 lbs.	1.95	
solid (700-*lb. drums*)	100 lbs.	2.30	/ 3.15

Antiscorch Materials

A-F-B	lb.	.35	/ .40
Antiscorch T	lb.	.90	
Cumar RH	lb.	.105	
E-S-E-N	lb.	.35	/ .40
R-17 Resin (*drums*)	lb	.1075	
RM	lb.	1.25	
Retarder W	lb.	.36	
Retardex	lb.	.45	/ .48
U-T-B	lb.	.35	/ .40

Antiseptics

Compound G-4	lb.		
G-11	lb.		

Antisun Materials

Heliozone	lb.	.23	/ .24
S.C.R.	lb.	.33	/ .35
Sunproof	lb.	.23	/ .28
Jr.	lb.	.165	/ .215

*Prices in general are f.o.b. works. Range indicates grade or quantity variations. Space limitation prevents listing of known ingredients. Requests for information not recorded will receive prompt attention.

Blowing Agents

Ammonium Carbonate, lumps (500-*lb. drums*)	*lb.*	
Unicel	*lb.*	$0.50

Brake Lining Saturant

B.R.T. No. 3	*lb.*	.0175/$0.0185

Colors

Black

Du Pont powder	*lb.*	.42 / .44
Lampblack (commercial), *l.c.l.*	*lb.*	.15

Blue

Du Pont Dispersed	*lb.*	.83 / 3.95
Powders	*lb.*	2.25 / 3.75
Heliogen BKA	*lb.*	
Toners	*lb.*	

Brown

Mapico	*lb.*	**.11**

Green

Chrome	*lb.*	.25
oxide (*freight allowed*)	*lb.*	.24
Du Pont Dispersed	*lb.*	.98 / 2.85
Powders	*lb.*	1.00 / 5.50
Guignet's (*bbls.*)	*lb.*	.70
Toners	*lb.*	

Orange

Du Pont Dispersed	*lb.*	.88 / 2.00
Powders	*lb.*	.88 / 2.75
Toners	*lb.*	

Orchid

Toners	*lb.*	

Pink

Toners	*lb.*	

Purple

Toners	*lb.*	

Red

Antimony		
Crimson, 15/17%	*lb.*	
R. M. P. No. 3	*lb.*	.48
Sulphur free	*lb.*	
R.M.P.	*lb.*	.52
Golden 15/17%	*lb.*	
7-A	*lb.*	.37
Z-2	*lb.*	.25
Cadmium, light (400-*lb. bbls.*)	*lb*	.80 / .95
Du Pont Dispersed	*lb.*	**.93 / 2.05**
Powders	*lb.*	.30 / 1.65
Iron Oxide, *l.c.l.*	*lb.*	
Mapico	*lb.*	.0975
Rub-Er-Red (*bbls.*)	*lb.*	.0975
Toners	*lb.*	

White

Lithopone (*bags*)	*lb.*	.0385/ .0410
Albalith	*lb.*	.0425/ .045
Astrolith (50-*lb. bags*)	*lb.*	**.0385/ .0410**
Azolith	*lb.*	.0425/ .045
Titanium Pigments		
Ray-bar	*lb.*	.055 / .065
Ray-cal	*lb.*	**.0525/ .0625**
Rayox	*lb.*	**.135 / .165**
Titanolith (50-*lb. bags*)	*lb.*	.056 / .0585
Titanox-A	*lb.*	.155 / .1825
B	*lb.*	.06 / .0625
30	*lb.*	.06 / .0625
C	*lb.*	.0575/ .06
M	*lb.*	**.0575/ .0625**
Ti-Tone	*lb.*	
Zopaque (50-*lb. bags*)	*lb.*	.145 / .1525
Zinc Oxide		
Azo ZZZ-11	*lb.*	.0725/ .075
44	*lb.*	.0725/ .075
55	*lb.*	.0725/ .075
66	*lb.*	.085 / .0875
French Process, Florence		
Green Seal-8	*lb.*	.09 / .0925
Red Seal-9	*lb.*	.085 / .0875
White Seal-7	*lb.*	.095 / .0975
Kadox, Black Label-15	*lb.*	.0725/ .075
No. 25	*lb.*	.085 / .0875
Red Label-17	*lb.*	.0725/ .075
Horse Head Special 3	*lb.*	.0725/ .075
XX Red-4	*lb.*	.0725/ .075
23	*lb.*	.0725/ .075
72	*lb.*	.0725/ .075
78	*lb.*	.0725/ .075
80	*lb.*	.0725/ .075
103	*lb.*	.0725/ .075
110	*lb*	.0725/ .075
St. Joe (lead free)		
Black Label	*lb.*	.0725/ .075
Green Label	*lb.*	.0725/ .075
Red Label	*lb.*	.0725/ .075
U.S.P	*lb.*	.105 / .1075
Zinc Sulphide Pigments		
Cryptone-BA-19	*lb.*	.056 / .0585
BT	*lb.*	.056 / .0585
CB	*lb.*	.056 / .0585
MS	*lb.*	.0575/ .06
ZS No. 20	*lb.*	.0825/ .085
86	*lb.*	.0825/ .085
230	*lb.*	.0825/ .085
800	*lb.*	.0825/ .085
Sunolith	*lb.*	.0425/ .045

Yellow

Cadmolith (cadmium yellow), (400-*lb. bbls.*)	*lb*	$0.60 /$0.65
Du Pont Dispersed	*lb.*	**1.25 / 1.75**
Powders	*lb.*	.16 / 1.75
Mapico	*lb.*	.0725
Toners	*lb.*	

Dispersing Agents

Bardex	*lb.*	.0425/ .045
Bardol	*lb.*	.025 / .0275
B	*lb.*	.05 / .0525
Darvan No. 1	*lb.*	**.30 / .34**
No. 2	*lb.*	.30 / .34
Nevoll (*drums, c.l.*)	*lb.*	.025
Santomerse S	*lb.*	**.11 / .25**

Fillers, Inert

Asbestine, *c.l.*	*ton*	15.00
Asbestos Fiber	*ton*	15.50 /44.00
Barytes	*ton*	40.00
f.o.b., St. Louis (50-*lb. paper bags*)	*ton*	25.55
off color, domestic	*ton*	25.00
white, domestic	*ton*	35.00
Blanc fixe, dry, precip.	*lb.*	.055 / .06
Calcene	*ton*	37.50 /43.00
Infusorial earth	*lb.*	.03
Kalite No. 1	*ton*	26.00
3	*ton*	36.00
Kalvan	*ton*	100.00
Magnesium Carbonate, *l.c.l.*	*lb.*	.0725
Paradene No. 2 (*drums*)	*lb.*	**.05**
Pyrax A	*ton*	7.50
Whiting		
Columbia Filler	*ton*	9.00 /14.00
Suprex White	*ton*	32.50
Witco, *c.l.*	*ton*	**8.00**

Finishes

Black-Out (surface protective)	*gal.*	4.50 / 5.00
Mica, *l.c.l.*	*ton*	
Rubber lacquer, clear	*gal.*	**1.00 / 2.00**
colored	*gal.*	**2.00 / 3.50**
Shoe Varnish	*gal.*	**1.45**
Talc	*ton*	25.00

Flock

Cotton flock, dark	*lb.*	.09 / .11
dyed	*lb.*	.40 / .80
white	*lb.*	.12 / .20
Rayon flock, colored	*lb.*	1.00 / 1.50
white	*lb.*	**.75 / 1.00**

Latex Compounding Ingredients

A-342	*lb.*	**1.00 / 1.25**
Accelerator 85	*lb.*	.35
89	*lb.*	1.20
122	*lb.*	1.30
552	*lb.*	1.90
Aerosol OT Aqueous 10%	*lb.*	
Antox, dispersed	*lb.*	.42
Aquarex D	*lb.*	.75
F	*lb.*	**.85**
Areskap No. 50	*lb.*	.18 / .24
100, dry	*lb.*	**.39 / .51**
Aresket No. 240	*lb.*	.16 / .22
300, dry	*lb.*	**.42 / .50**
Aresklene No. 375	*lb.*	.35 / .50
400, dry	*lb.*	**.51 / .65**
Black No. 25, dispersed	*lb.*	.22 / .40
Casein	*lb.*	
Collocarb	*lb.*	.07
Color Pastes, dispersed	*lb.*	.38 / 1.90
Copper Inhibitor X-872	*lb.*	**2.25**
Dispersex No. 15	*lb.*	.11 / **.12**
No. 20	*lb.*	.08 / .10
Factex Dispersion A	*lb.*	**.16**
Heliozone, dispersed	*lb.*	**.25**
Igepon A	*lb.*	
Latac	*lb.*	**2.50**
MICRONEX, Colloidal	*lb.*	.06 / 07
Nekal BX (dry)	*lb.*	
Pipsol X	*lb.*	3.05 / **3.55**
R-2 Crystals	*lb.*	**2.50 / 2.75**
RN-2 Crystals	*lb.*	1.90 / **2.15**
S-1 (400-*lb. drums*)	*lb.*	**.65**
Santobrite Briquettes	*lb.*	
Powder	*lb.*	
Santomerse D	*lb.*	**.41 / .65**
S	*lb.*	**.11 / .25**
Sodium Stearate	*lb.*	.34 / .37
Stablex A	*lb.*	**.90 / 1.10**
B	*lb.*	**.65 / .90**
C	*lb.*	**.40 / .50**
Sulphur, dispersed	*lb.*	**.10 / .15**
No. 2	*lb.*	.08 / .12
T-1 (440-*lb. drums*)	*lb.*	**.40**
Tepidone	*lb.*	**.63**
Vulcan Colors	*lb.*	
Zenite Special	*lb.*	**.55**
Zinc oxide, dispersed	*lb.*	**.12 / .15**

Mineral Rubber

Black Diamond, *l.c.*	*ton*	25.00 /27.00
B.R.C. No. 20	*lb.*	.0105/ .0115
Hydrocarbon, hard	*ton*	**25.00 /27.00**
Genasco Hydrocarbon, granulated	*ton*	
solid	*ton*	
Gilsonite	*ton*	
Parmr	*ton*	25.00 **/29.00**
Pioneer, *c.l.*	*lb.*	25.00 **/27.00**
285°-300°	*ton*	**25.00 /27.00**

Mold Lubricants

Aluminum Stearate	*lb.*	$0.21 /$0.24
Aquarex D	*lb.*	.75
WA Paste	*lb.*	.25
Colite	*gal.*	.09 / 1.15
Lubrex	*lb.*	**.25 / .30**
Mold Paste	*lb.*	**.12 / .18**
Rubber-Glo, conc. regular	*gal.*	.94 / **1.15**
Type W	*gal.*	**.99 / 1.20**
Sericite	*ton*	75.00
Soapstone, *l.c.l.*	*ton*	20.00
Zinc Stearate	*lb.*	.28 / .30

Oil Resistant

A-X-F	*lb.*	**.82 / .85**

Reclaiming Oils

B.R.V	*lb.*	.035 / .0375
No. 1621	*lb.*	.021 / .0235
S.R.O.	*lb.*	.02 / .0225
X-159	*gal.*	**.20 / .32**

Reenforcers

Carbon Black		
Aerfloted Arrow Specification (*bags only*)	*lb.*	.0355†
Arrow Compact Granulized	*lb*	.0355†
Certified Heavy Compressed (*bags only*)	*lb.*	**.0335†**
Spheron	*lb.*	**.0335†**
Continental, dustless	*lb.*	**.0335†**
Compressed (*bags only*)	*lb.*	**.0335†**
Disperso	*lb.*	**.0335†**
Dixie	*lb.*	.0355†
Dixiedensed	*lb.*	.0355†
66	*lb.*	.0355†
Excello, dustless	*lb.*	**.0335†**
Furnex	*lb.*	.035
Beads	*lb.*	.035
Gastex	*lb.*	.035 / .06
HX	*lb.*	.0355†
Kosmobile	*lb.*	.0355†
66	*lb.*	.0355†
Kosmos	*lb.*	.0355†
MICRONEX Beads	*lb.*	.0355†
Mark II	*lb.*	.0355
Standard	*lb.*	.0355
W-5	*lb.*	.0355
W-6	*lb.*	.0355
P-33	*lb.*	**.0475**
Pelletex	*lb.*	.035 / .06
Supreme, dustless	*lb.*	**.0335†**
Thermax	*lb.*	**.0225**
TX	*lb.*	.0355†
Velvetex	*lb.*	**.04 / .06**
"WYEX BLACK"	*lb.*	.0355†
Carbonex Flakes	*lb.*	.03 / .035
S	*lb.*	.031 / .036
Plastic	*lb.*	.031 / .0335
Clays		
Aerfloted Paragon (50-lb. bags)	*ton*	10.00
Suprex (50-*lb. bags*)	*ton*	11.00 /23.50
Barden	*ton*	**10.00**
Catalpo, *c.l.*	*ton*	30.00
Chicora	*ton*	10.00
China	*ton*	22.50
Crown	*ton*	11.00
Dixie	*ton*	11.00
Hi-White	*ton*	10.00
"L"	*ton*	
LGB	*ton*	15.00
Langford	*ton*	8.50
McNamee	*ton*	**10.00**
Par	*ton*	11.00
Paraforce, *c.l.*	*ton*	50.00
Witco, *c.l.*	*ton*	**10.00**
Cumar EX	*lb.*	.05
MH	*lb.*	.065 / **.115**
V	*lb.*	.095 / **.125**
Silene	*lb.*	**.04 / .045**

Reodorants

Amora A	*lb.*	
B	*lb.*	
C	*lb.*	
D	*lb.*	
Curodex 19	*lb.*	
188	*lb.*	
198	*lb.*	
Para-Dors	*lb.*	
Rodo No. 0	*lb.*	**4.00 / 4.50**
10	*lb.*	5.00 / **5.50**

Rubber Substitutes

Black	*lb.*	**.08 / .13**
Brown	*lb.*	.08 / .135
White	*lb.*	.085 / .145
Factice		
Amberex Type B	*lb.*	**.1875**
Brown	*lb.*	.085 / .155
Fac-Cel B	*lb.*	**.15**
C	*lb.*	**.15**
Neophax A	*lb.*	**.135**
B	*lb.*	**.135**
White	*lb.*	.09 / .155

(Continued on page 422)

†Price quoted is f.o.b. works (bags). The price f.o.b. works (bulk) is $0.033 per pound. **All prices are carlot.**

PRECISION

The known consistency of our Metallic Stearates is your guarantee of uniform performance.

METALLIC STEARATES OF KNOWN UNIFORMITY

WARWICK Chemical Company

MANUFACTURERS OF CHEMICALS

WEST WARWICK, RHODE ISLAND — 580 FIFTH AVE., N. Y. C. — ROCK HILL, S. C.

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RMP

ANTIMONY

FOR RED RUBBER

....The utmost in pleasing appearance with no deteriorating effect whatever.

●

RARE METAL PRODUCTS CO.
BELLEVILLE, N. J.

Regular and Special Constructions of

COTTON FABRICS

Single Filling Double Filling and

ARMY

Ducks

HOSE and BELTING

Ducks

Drills

Selected

Osnaburgs

Curran & Barry
320 BROADWAY
NEW YORK

COTTON AND FABRICS

NEW YORK COTTON EXCHANGE WEEK-END CLOSING PRICES

Futures	Oct. 25	Nov. 29	Dec. 6	Dec. 13	Dec. 20	Dec. 27
Dec.	16.23	16.14	17.74	16.21	.....	.....
Jan.	.....	.....	16.20	16.82	16.36	16.55	16.56
Mar.	16.52	16.42	17.05	16.63	16.92	16.96
July	16.72	16.53	17.24	16.80	17.10	17.16
Sept.	16.82	16.55	17.28	16.83	17.12	17.17
Oct.	.....	.....	16.56	17.30	16.85	17.12	17.18

New York Quotations

December 29, 1941

Drills

38-inch 2.00-yard	yd.	....
40-inch 3.47-yard		....
50-inch 1.52-yard		80.30½
52-inch 1.85-yard		.25⅜
52-inch 1.90-yard	.2338	.24⅛
52-inch 2.20-yard		.21½
52-inch 2.50-yard		.18⅞
59-inch 1.85-yard		.24

Ducks

38-inch 2.00-yard D. F.	yd.	.22 /.22½
40-inch 1.45-yard S. F.		.30⅛
51½-inch 1.35-yard D. F.		.31⅞
72-inch 1.05-yard D. F.	.4334	/.50
72-inch 17-21 ounce		.57

Mechanicals

Hose and belting	lb.	.45½

Tennis

51¼-inch 1.35-yard	yd.	.33⅛
51½-inch 1.60-yard	yd.	.29⅛
51½-inch 1.90-yard	yd.	.24¾

Hollands—White

Blue Seal

20-inch	yd.	.12
30-inch		.21½
40-inch		.24

Gold Seal

20-inch No. 72	yd.	.12¾
30-inch No. 72		.22½
40-inch No. 72		.25⅜

Red Seal

20-inch	yd.	.11¼
30-inch		.20¼
40-inch		.22½

Osnaburgs

40-inch 2.34-yard	yd.	.19⅛
40-inch 2.48-yard		.18
40-inch 2.56-yard		.14¼
40-inch 3.00-yard		.15
40-inch 7-ounce part waste		.13⅜
40-inch 10-ounce part waste		.19
37-inch 2.42-yard clean		.18¼

Raincoat Fabrics

Cotton

Bombazine 64 x 60	yd.	....
Plaids 60 x 48		....
Surface prints 64 x 60		....
Print cloth, 38½-inch, 64 x 60		.08317

Sheetings, 40-Inch

48 x 48, 2.50-yard	yd.	.14800
64 x 68, 3.15-yard		.12857
36 x 60, 3.60-yard		.10972
44 x 40, 4.25-yard		.08941

Sheetings, 36-Inch

48 x 48, 5.00-yard	yd.	.07900
44 x 40, 6.15-yard		.06423

Tire Fabrics

Builder

17¼ ounce 60" 23/11 ply Karded peeler	lb.	.44

Chafer

14 ounce 60" 20/8 ply Karded peeler	lb.	.43
9¼ ounce 60" 10/2 ply Karded peeler	lb.	.43

Cord Fabrics

23/5/3 Karded peeler, 1/16" cotton	lb.	.44
15/3/3 Karded peeler, 1/16" cotton	lb.	.42
12/4/2 Karded peeler, 1/16" cotton	lb.	.43
23/5/3 Karded peeler, 1¼" cotton	lb.	.44
23/5/3 Combed Egyptian	lb.	.44

Leno Breaker

8¼ ounce and 10¼ ounce 60" Karded peeler	lb.	.44

MODERATE gains were noted in the December cotton market which had a decidedly stronger tone near the end of the month than in November. Fluctuations were irregular, and war nervousness was reflected by falling prices immediately after Japan's initial attack, but Allied successes toward the middle of the month served to steady the market. The declines and recoveries are reflected in the movements of the 18-inch spot middling price, which, after closing at 17.46¢ per pound on November 29, rose to 18.24¢ on December 5, slumped to 17.85¢ on December 9, firmed to 18.28¢ on December 22, and closed at 18.55¢ on December 31.

Based on conditions as of December 1, the Crop Reporting Board of the Department of Agriculture forecast a United States harvest of 10,976,000 gross weight bales of 500 pounds for the 1941-42 season. This figure compares with the November 1 estimate of 11,020,000 bales and a final yield of 12,556,000 bales from the 1940-41 crop.

The Bureau of the Census reported a consumption of 849,733 bales in November against 953,600 bales in October and 744,088 bales for November, 1940. Cotton of 1941 growth ginned to December 13 was 9,915,117 running bales, counting rounds as half bales and excluding linters, compared to 11,430,454 bales ginned to that date in 1940, the Bureau of the Census also reported.

Delay in final enactment of the price control bill accentuated the dullness characteristic of the market near the close of the year. The farm bloc continued to urge high ceiling prices. No Senate action was taken on the 110% of parity clause for farm products of the price control bill which the trade believes to be the minimum acceptable to the farm bloc.

It is believed that greatly increased army requirements will increase domestic consumption in the current crop year to more than 11,000,000 bales, and a tentative estimate of 12,000,000 bales has been made for the 1942-43 season. Such heavy consumption might necessitate the use of a portion of Commodity Credit Corp. cotton stocks. The trade will watch closely the policy of that agency concerning its stock.

It is expected that 1941 consumption will closely parallel the crop and may be even greater. Certain types of cotton are already scarce and are expected to grow more so as the season approaches its end. About 1,500,000 bales of 1941 cotton have been sealed under the loan program, and the demand is now reported to be greater than the free supply. These shortages may effect a rise above parity in raw cotton.

The Department of Agriculture has announced preliminary state cotton acreage allotments for 1942 totaling about 26,598,000 acres. The 1941 allotments totaled 27,400,000 acres, of which 23,250,000 acres were actually planted.

Fabrics

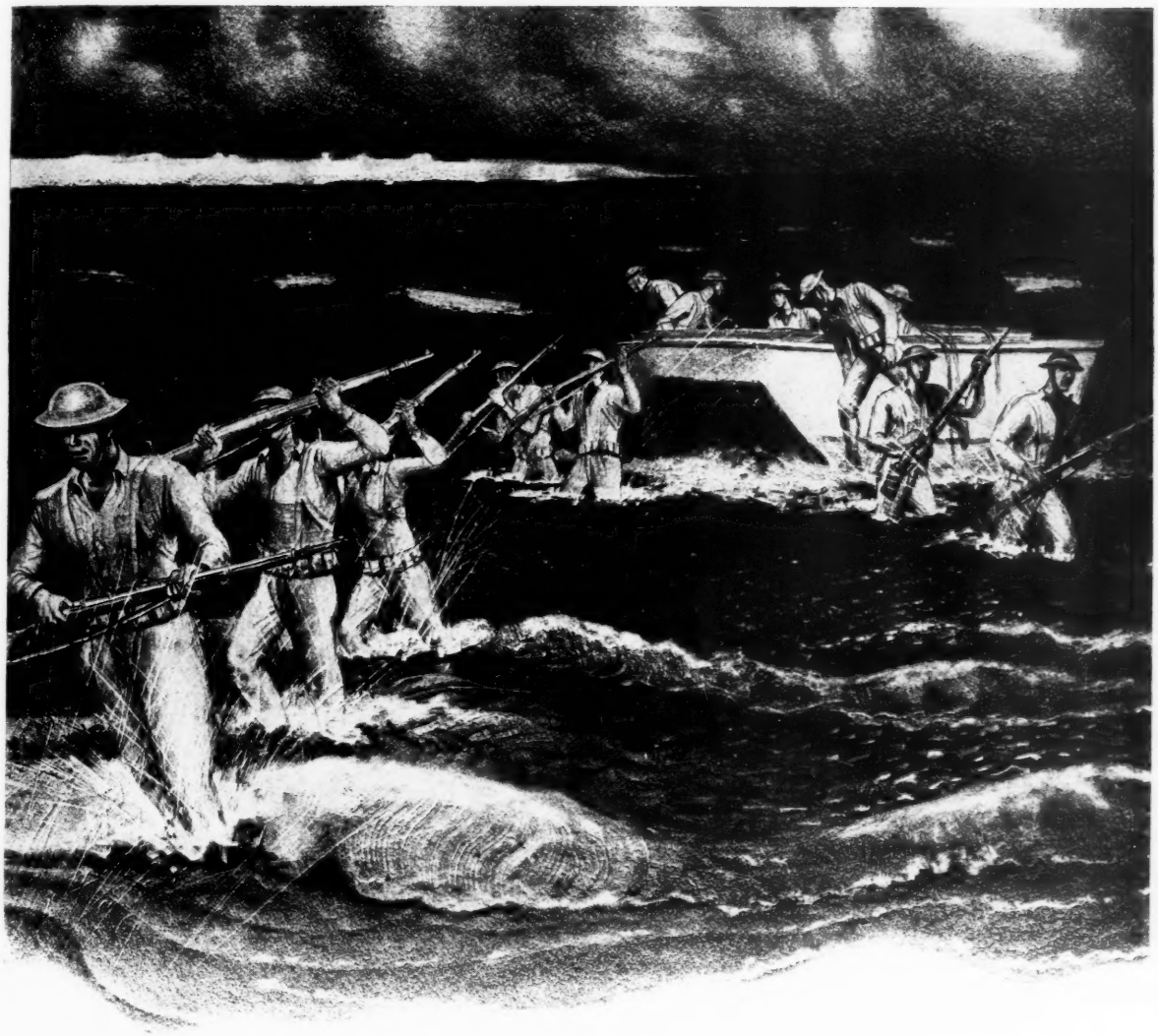
Fabric prices became firmer as the scarcity of cloth manifested itself together with a growing remoteness of distant deliveries available under new contract agreements. After the middle of December there was no trading in non-ceiling goods, as prices obtained on some of these fabrics early in the month could no longer be realized because of the OPM order December 18 freezing non-ceiling gray and finished goods at the highest prices sellers received during the period November 1 to December 6, 1941. It was believed that definite ceilings on a sliding scale basis, which in some cases might result in a marked price reduction, would follow the freezing order. It was further believed that the new restrictions would be sweeping in scope and cover all levels in distribution and production except retail. Little goods were sold in the latter portion of the month except on government orders. Mills were largely withdrawn from the market because of sold-up conditions for the near term and a reluctance to offer for more distant deliveries until future defense and civilian needs can be estimated.

Only a few scattered orders for print cloths were reported as the month drew to a close. Drills were quiet; there was moderate trade in sheetings, but offerings of part waste osnaburgs were scant. Large Army and Navy orders are expected to contribute to increased activity in the textile market during the early months of the war.

A revised schedule for combed cotton gray goods with maximums keyed to raw cotton prices was expected to be released about January 1. A limited amendment to Price Schedule No. 11 announced by the OPA December 10 permits transactions in the fabric market to be made without specifying prices provided the parties agree settlement will be made in accordance with applicable prices in the revised schedule when issued.

An amendment to the price schedules for carded cotton yarn and carded gray and colored yarn cotton goods, applicable to drills and part waste osnaburgs, issued on November 26, 1941, by the OPA permits deliveries under contracts made before July 21, at maximum prices corresponding to a spot cotton price of 15.99¢ per yard. It is expected that clean osnaburgs will be included in this schedule soon, but until that time clean osnaburgs are required to be sold at prices reflecting the normal difference between that cloth and the part waste grade.

Dealers are reported to predict a steadily growing firmness in the market with reasonable price advances. Increases of 1¢ per yard in some grades of drills have been announced, as have slight fractional increases of 3/16¢ per yard in ducks and tennis ducks, and varying increases in osnaburgs of from ½¢ to ¾¢ per yard. Sheetings for the rubberizing trade were reported scarce and up from ⅓¢ to ⅔¢ per yard. Prices on Hollands are unchanged. Prices on most grades of raincoat fabrics are unavailable. Most tire fabrics prices are reported to be up from 3½¢ to 6½¢ per yard.



LANDING PARTY... Landing through the surf to establish a beachhead position is a specialty of the Marines. Note how guns are held high in the air to keep them dry and ready for immediate use when shore is reached. Gunner who covers landing barges' approach with his machine gun mounted in bow is about to dismount his weapon for use ashore. In an extensive attack, Blue Jackets would land and fight with the Marines, having previously dyed their white uniforms khaki color by dipping them in coffee.

In our rapidly expanding naval forces, cotton plays a vital part in the construction of ships and the equipment of men. It's used for leggings, uniforms, cartridge belts, hammocks, awnings, hatch covers, life belts, gun covers, etc.

This in turn calls for the use of so much of our heavy fabric that your normal supplies of HOSE and BELTING DUCK may be somewhat curtailed during the present emergency.

WELLINGTON SEARS COMPANY • 65 Worth Street, New York, N. Y.

Cottons FOR DEFENSE...WELLINGTON SEARS FOR *Cottons*

Current Quotations

(Continued from page 418)

Softeners and Plasticizers

B.R.T. No. 7	lb.	$0.02 /$0.021
Bondogen	lb.	.98 / 1.05
Burgundy pitch	lb.	
Copene Resin	lb.	.32
Cycline oil	gal.	.14 / .20
Dipolymer Oil	gal.	.30 / .35
Dispersing Oil No. 10	lb.	.0375/ .04
Nevinol	lb.	.13 / .14
Nuba resinous pitch (*drums*)		
Grades No. 1 and No. 2	lb.	.029
3-X	lb.	.0425
Nypene Resin	lb.	.32
Palm oil (Witco), *c.l.*	lb.	
Palmol	lb.	.15
Para Flux	gal.	.09 / .18
No. 2016	gal.	.125 / .20
Para Lube	lb.	.0425/ .048
Piccolyte Resin	lb.	.14 / .175
Pine tar	gal.	
Oil	gal.	
Plastogen	lb.	.0775/ .08
Plastone	lb.	.27 / .30
R-19 Resin (*drums*)	lb.	.1075
21 Resin (*drums*)	lb.	.1075
Reogen	lb.	.115 / .12
RPA No. 1	lb.	.65
2	lb.	.65
3	lb.	.46
4	lb.	.80
Tackol	lb.	.085 / .18
Tonox	lb.	.52 / .61
Tonox D	lb.	.75 / .85
Witco No. 20, *l.c.l.*	gal.	.20
X-1 resinous oil (*tank car*)	lb.	.011

Softeners for Hard Rubber Compounding

Resin C Pitch 45° C. M.P.	lb.	.015 / .016
60°C. M.P.	lb.	.015 / .016
75°C. M.P.	lb.	.015 / .016

Solvents

Beta-Trichlorethane	lb.	.20
Carbon Bisulphide	lb.	
Tetrachloride	gal.	
Cosol No. 1	gal.	.26
No. 2	gal.	.25
No. 3	gal.	.22
Industrial 90% benzol (*tank car*)	gal.	.15
Skellysolve	gal.	

Stabilizers for Cure

Barium Stearate	lb.	$0.27 /$0.30
Calcium Stearate	lb.	.23 / .27
Laurex (*bags*)	lb.	.15 / .175
Lead Stearate	lb.	
Magnesium Stearate	lb.	.29 / .32
Stearex B	lb.	.1425/ .1525
Beads	lb.	.1375/ .1475
Stearic acid, single pressed	lb.	.1425/ .1525
Stearite, *c.l.*	lb.	.1325
Zinc Laurate	lb.	.29 / .32
Stearate	lb.	.28 / .31

Synthetic Rubber

Hycar O. R.	lb.	.70 / 1.00
Neoprene Type CG	lb.	.70
E	lb.	.65
FR	lb.	.75
G	lb.	.70
GN	lb.	.65
I	lb.	.70
KN	lb.	.75
M	lb.	.65
Neoprene Latex Type 56	lb.	.30
57	lb.	.30
Synthetic 100	lb.	.41
"Thiokol" Type "A"	lb.	.35 / .45
"F"	lb.	.45 / .55
"FA"	lb.	.50 / .60
"RD"	lb.	.70

Tackifier

B.R.H. No. 2	lb.	.02 / .021

Vulcanizing Ingredients

Magnesia, light (for neoprene)	lb.	.25 / .26
Sulphur	100 lbs.	
Chloride (*drums*)	lb.	.04
Telloy	lb.	1.75
Vandex	lb.	1.75
(See also Colors—Antimony)		

Waxes

Carnauba, No. 3 chalky	lb.	
2 N.C.	lb.	
3 N.C.	lb.	
1 Yellow	lb.	
2	lb.	
Carnube	lb.	.46 / .56
Monten	lb.	.12 / .17
Rubber Wax No. 118, Neutral	gal.	.60 / 1.15
Colors	gal.	.70 / 1.25

United States Latex Imports

Year	Pounds (d.r.c.)	Value
1939	61,460,003	$10,467,552
1940	75,315,775	14,543,975
1941		
Jan.	4,892,860	1,019,741
Feb.	6,598,930	1,279,648
Mar.	3,822,583	774,225
Apr.	3,570,742	648,217
May	5,895,381	1,117,226
June	4,637,095	936,944
July	4,589,007	930,126
Aug.	4,443,527	779,079
Sept.	8,084,362	1,795,345

Data from United States Department of Commerce, Washington, D. C.

Rubber and Canvas Footwear Statistics

	Thousands of Pairs		
	Inventory	Production	Shipments
1938	16,183	50,812	54,942
1939	16,388	60,612	60,377
1940	11,129	57,278	62,480
1941			
Jan.	10,377	5,939	6,614
Feb.	10,754	5,543	5,166
Mar.	11,222	5,827	5,359
Apr.	12,272	6,628	5,555
May	13,223	6,084	5,134
June	13,834	6,278	5,668
July	12,256	4,789	6,366
Aug.	10,809	5,543	6,990
Sept.	9,228	5,844	7,422
Oct.	8,650	6,848	7,433

The above figures have been adjusted to represent 100% of the industry based on reports received which represented 81% for 1936-37.
Source: *Survey of Current Business*, Bureau of Foreign & Domestic Commerce, Washington, D. C.

Spain

The rubber industry in Spain has been hampered by a shortage of rubber, fabric, and carbon black which was acute enough in the first half of 1940 to force the closing of most factories making tires and rubber sundries. Toward the end of the first half of 1941, the arrival of 1,000 metric tons of crude rubber from Singapore in addition to small amounts of scrap rubber from the United States relieved the situation somewhat, at least as far as rubber supplies were concerned. The raw rubber was immediately distributed to tire manufacturers who were thus able to operate almost continuously during the third quarter; but it is feared that the inability to obtain adequate amounts of carbon black and fabric besides rubber, will prolong the condition of chronic shortage of urgently needed tires.

Other small shipments of crude rubber also arrived, and these together with rubber released from the free ports were allotted chiefly to manufacturers of sundries. Rubber sole factories have to depend mainly on reclaimed rubber.

Palestine

The developments of hostilities in the Near East has forced Palestine to solve various new transportation problems resulting in an increased demand for tires. Existing stocks of these goods have been depleted, and so far it has not been possible to obtain delivery of tires ordered from Britain many months ago. If Palestine cannot buy the needed supplies from other parts of the British Empire, she faces a serious shortage here. In 1940 imports of automobile and truck tires and tubes amounted to 711,000 kilos.

Peru

Peru's 1940 tire imports came to 1,300,306 kilos, against 1,106,430 kilos in 1939; while imports of tubes were 98,952 kilos, against 86,985 kilos. About 50% of these goods were supplied by Canadian firms which for the most part are branches of United States companies.

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(Continued from page 411)

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PRODUCTION MANAGER, NOW DOING CONSULTING WORK, desires change. Twenty years' broad experience in manufacture of mechanical, synthetic and sponge rubber products. Competent as superintendent, or technical SUPERINTENDENT IN CHARGE OF DEVELOPMENT AND COMPOUNDING. EXPERT IN USE OF RECLAIMS AND LOW COST COMPOUNDING. Address Box No. 365, care of INDIA RUBBER WORLD.

RUBBER CHEMIST. 3 YEARS' EXPERIENCE IN compounding of rubber and synthetics, plant and laboratory management, molding, processing problems. Desires responsible position. Location immaterial. Address Box No. 366, care of INDIA RUBBER WORLD.

GRADUATE CHEMIST AND RUBBER SPECIALIST in short process reclaiming, and compounding; molded goods; 15 years' experience, seeks position in Eastern plant. Now employed. Address Box No. 368, care of INDIA RUBBER WORLD.

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The Patten Air Lift Machine will cut 3,500 to 6,000 pairs of taps or soles, from unvulcanized sheet rubber, in eight hours, producing a uniformly cut sole or tap with any beveled edge from 30° to 90°.
Standard type for cutting soling to ½ inch thick and Heavy Duty type for solings to over one inch thick.
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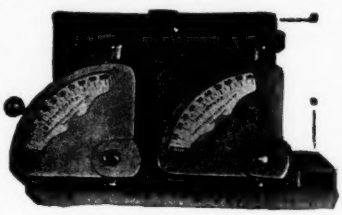
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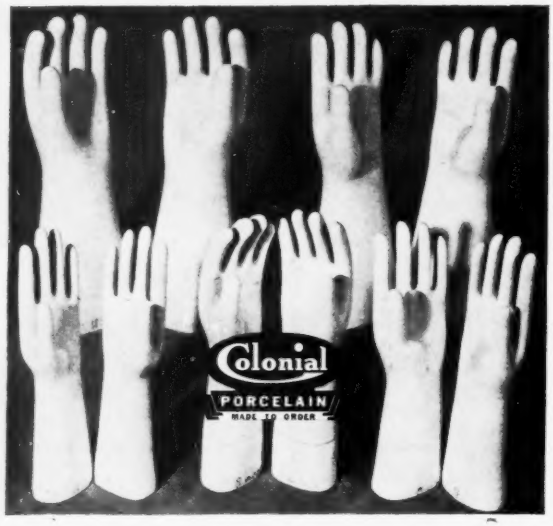

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Write today for our new catalog covering rubber glove and other forms for dipped rubber goods. Prompt attention given to requests for quotations based on your specifications or stock items.

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Akron, Ohio, U. S. A.

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Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
American Hair & Felt Co...	Com.	$1.00 yr.-end	Jan. 2	Dec. 22
American Hard Rubber Co..	Com.	$3.00 yr.-end	Dec. 22	Dec. 12
American Hard Rubber Co..	8% Pfd.	$2.00 q.	Dec. 22	Dec. 12
Baldwin Rubber Co.	Com.	$0.125	Jan. 21	Jan. 9
Baldwin Rubber Co.	6% Pfd.	$1.50 q.	Jan. 15	Dec. 31
Carborundum Co.	Com.	$1.75 yr.-end	Dec. 26	Dec. 16
Collyer Insulated Wire Co...	Com.	$0.50	Dec. 27	Dec. 22
Crown Cork International Corp.	"A"	$0.10	Dec. 23	Dec. 12
Endicott Johnson Corp.	Com.	$0.75 q.	Jan. 1	Dec. 26
Endicott Johnson Corp.	5% Pfd.	$1.25 q.	Jan. 1	Dec. 26
Firestone Tire & Rubber Co.	Com.	$0.25 yr.-end	Jan. 20	Jan. 5
Garlock Packing Co.....	Com.	$0.75	Dec. 24	Dec. 13
Goodyear Tire & Rubber Co. of Canada, Ltd.	Com.	$2.50 extra	Jan. 2	Dec. 15
Goodyear Tire & Rubber Co. of Canada, Ltd.	Com.	$0.63 q.	Jan. 2	Dec. 15
Goodyear Tire & Rubber Co. of Canada, Ltd.	5% Pfd.	$0.625 q.	Jan. 2	Dec. 15
Jenkins Bros.	Fdrs. Shrs.	$4.00 yr.-end	Dec. 23	Dec. 12
Jenkins Bros.	Non-Vt.	$1.00 yr.-end	Dec. 23	Dec. 12
Jenkins Bros.	7% Pfd.	$1.75 q.	Dec. 23	Dec. 12
I. B. Kleinert Rubber Co....	Com.	$0.30 irreg.	Dec. 23	Dec. 10
Lee Rubber & Tire Corp....	Com.	$0.75	Feb. 2	Jan. 15
Mansfield Tire & Rubber Co.	Com.	$0.30 extra	Dec. 20	Dec. 10
Mansfield Tire & Rubber Co.	Com.	$0.25 q.	Dec. 20	Dec. 10
Rome Cable Corp.	Com.	$0.15 q.	Dec. 29	Dec. 10
Rome Cable Corp.	Com.	$0.15 q.	Mar. 31	Mar. 10
Seiberling Rubber Co.	Com.	$0.25 resumed	Jan. 15	Dec. 27
Seiberling Rubber Co.	Prior Pfd.	$0.62 q.	Jan. 1	Dec. 20
Seiberling Rubber Co.	"A" Pfd.	$1.25 q.	Jan. 1	Dec. 20
Seiberling Rubber Co.	"B" Pfd.	$1.04 initial	Jan. 15	Dec. 27
United States Rubber Co....	Com.	$1.50 yr.-end	Dec. 22	Dec. 15
U. S. Rubber Reclaiming Co., Inc.	Pfd.	$2.00 accum.	Dec. 27	Dec. 23
Western Electric Co., Inc...	Com.	$0.75	Dec. 30	Dec. 23

Farrel-Birmingham Laboratory

(*Continued from page 366*)

pressure up to a maximum of 150 pounds per square inch. Laboratory scales with metric graduations, portable scales of 1,000-pound capacity, tables, stock bins, shelves, and cupboards make the laboratory equipment complete for handling the materials being processed.

Just outside the main laboratory another room has been provided for the storage of both raw and processed materials.

Arrangements for the use of the laboratory facilities can be made by writing Farrel-Birmingham Co., Inc., Ansonia, Conn.

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See Page 429

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Continued

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FOR SALE: 1—Watson-Stillman Hydro-Pneumatic Accumulator; 1—5 ft. dia. Vulcanizer, with quick-opening door; 20-Semi-automatic Hydraulic Presses; 1—Birmingham 16″x36″ Rubber Mill, m.d.; 6—30″x40″, 1—38″x78″ Hydraulic Presses; Hydraulic Pumps, Calenders, Tubers, etc. CONSOLIDATED PRODUCTS CO., INC., 13-16 Park Row, New York, N. Y.

FOR SALE: Mikro Pulverizers; W. & P. Mixers; Brighton 80 gal. Change Can Mixers; Pony Mixers; Driers, etc. Cash Buyers of your surplus equipment—from single items to complete plants. BRILL EQUIPMENT CORPORATION, 183 Varick Street, New York City.

FOR SALE: 2—W. & P. Jack. Mixers, size 15, plain and vacuum type; 1—Day No. 30 Imperial Mixer; 1—Two-Roll Water-Cooled Rubber Mill, 6″ & 8″ dia. x 9″ face; 75 ft. Link Belt Conveyer, 36″ wide; Hydraulic Presses, Pumps and Accumulators, Rubber Mills, Mixers, Grinders, Pulverizers, Rotary Cutters, etc. Send for latest bulletins. We buy your surplus equipment. STEIN EQUIPMENT CORP., 426 BROOME ST., NEW YORK CITY.

FOR SALE: 1-VULCANIZER, 48″ DIAMETER, 50′ LONG, QUICK-opening door; 1—5′ diameter, 27′ long. 1—Birmingham 3-roll Calender, 20″ diameter, 48″ width, reduction gear, motor and motor generator set; also 1—Farrell 15x36 Mill, reduction and motor. Address Box No. 362, care of INDIA RUBBER WORLD.

FOR SALE: 1—54″ FARREL THREE-ROLL CALENDER; 2—42″ Mills; 5—30x30 Farrel Presses, 16″ rams; 1—20x20 Hydraulic Press; 2—24x30 Hydraulic Presses; 1—Accumulator; 1—56 Devine Drier; 2—Rubber Spreaders; 12 Churns; 1 Peerless Rubber Cutter. Address Box No. 363, care of INDIA RUBBER WORLD.

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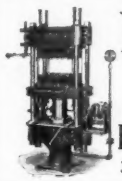
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Shipments of Crude Rubber from Producing Countries—Long Tons

Year	Malaya including Brunei and Labuan	N.E.I.	Ceylon	India	Burma	North Borneo	Sarawak	Thailand	French Indo-China	Total	Philippines and Oceania	Liberia	Nigeria (incl. Brit. Cameroons)	Other Africa	South America	Mexican Guayule	Grand Total
1939 ..	376,800	372,000	61,000	9,200	6,600	11,900	24,000	41,800	65,200	968,500	2,100*	5,400	2,800	6,600*	16,100	2,900	1,004,400
1940 ..	540,417	536,740	88,894	11,510	9,668	17,623	35,166	43,940	64,437	1,348,395	2,267*	7,223	2,903	7,200*	17,601	4,106	1,389,695
1941																	
Jan. ..	37,804	58,593	7,859	531	955	2,085	2,445	2,137	9,058	121,467	333	750*	67	600	2,103	288	125,608
Feb. ..	27,115	42,091	4,332	399	1,022	1,686	2,922	4,137	1,995	85,699	96	828	254	600	1,814	414	89,705
Mar. ..	56,651	53,233	6,073	485	1,285	1,154	3,726	5,712	6,286	134,605	117	958	36	600	2,835	355	139,506
Apr. ..	40,590	48,915	6,985	497	1,164	2,175	3,118	4,271	0	107,715	263	958	264	600	2,009	423	112,232
May ..	53,062	48,130	7,638	812	1,019	1,237	3,849	1,841	6,225	123,813	156	180	95	600	1,080	406	126,330
June ..	51,247	48,497	8,925	234	822	986	3,195	2,831	7,318	124,055	103	919	89	600	1,510	383†	127,659
July ..	53,373	53,429	7,387	273	666	1,803	3,799	3,614	3,445	127,789	169	711	200*	600	1,253	411†	131,133
Aug. ..	46,404	51,890	9,081	575	150	1,812	3,086	4,852	6,496	124,346	200*	750*	200*	600	1,288	250*	127,634
Sept. ..	70,598	65,708	6,706	87	58	1,371	2,495	6,524	8,000*	161,547	200*	750*	200*	600	1,421	250*	164,968
Oct. ..	31,101	54,038	8,315	1,030	533	2,264	3,044	3,074	6,000*	109,399	200*	750*	200*	600	2,149	250*	113,548

*Estimated. †Guayule rubber imports into U.S.A. provisional until export figures from Mexico are received. Source: *Statistical Bulletin of the International Rubber Regulation Committee.*

Dominion of Canada Statistics

Imports of Crude and Manufactured Rubber

	October, 1941		Ten Months Ending October, 1941	
UNMANUFACTURED	Quantity	Value	Quantity	Value
Crude rubber, etc.....*lb.*	9,365,787	$2,025,596	132,986,622	$28,625,955
Latex (dry weight) .....*lb.*	542,350	185,589	4,166,141	1,271,993
Gutta percha .....*lb.*	14,713	10,449	25,895	16,500
Rubber, recovered .....*lb.*	1,525,800	97,074	15,266,700	892,857
Rubber, powdered, and gutta percha scrap .....*lb.*	844,400	21,223	5,780,800	120,906
Balata .....*lb.*	13,188	4,667	61,377	18,199
Rubber substitute .....*lb.*	54,200	13,875	513,300	161,092
Totals	12,360,438	$2,358,473	158,800,835	$31,097,502
PARTLY MANUFACTURED				
Hard rubber comb blanks....	.....	$2,639	.....	$34,332
Hard rubber, n. o. s.....*lb.*	2,138	2,689	46,903	43,531
Rubber thread not covered.*lb.*	5,849	5,546	40,833	41,158
Totals	7,987	$10,874	87,736	$119,021
MANUFACTURED				
Bathing shoes .....*prs.*	.....	.....	35,177	$7,134
Belting	.....	$18,160	.....	166,174
Hose	.....	28,366	.....	263,602
Packing	.....	16,316	.....	102,618
Boots and shoes .....*prs.*	1,051	1,925	7,944	14,650
Canvas shoes with rubber soles .....*prs.*	5,885	4,536	35,404	13,886
Clothing, including waterproofed	.....	3,349	.....	35,376
Raincoats ....*no.*	3,052	16,710	55,495	223,207
Gloves .....*doz. prs.*	370	826	1,495	5,418
Hot water bottles.....	.....	355	.....	7,530
Liquid sealing compound	.....	11,145	.....	81,818
Tires, bicycle .....*no.*	501	459	20,296	15,260
Pneumatic .....*no.*	1,530	34,265	24,250	587,687
Solid for automobiles and motor trucks .....*no.*	24	1,053	373	18,712
Other solid tires	.....	2,047	.....	20,839
Inner tubes .....*no.*	557	2,984	14,778	51,451
Bicycle .....*no.*	412	196	15,419	4,386
Mats and matting	.....	19,338	.....	115,449
Cement	.....	13,131	.....	141,643
Golf balls .....*doz. prs.*	600	1,233	18,227	35,332
Heels .....*prs.*	2,529	241	78,238	5,449
Other rubber manufactures..	.....	262,660	.....	2,159,678
Totals	.....	$439,295	.....	$4,077,299
Totals, rubber imports..	.....	$2,808,642	.....	$35,293,822

Exports of Domestic and Foreign Rubber Goods

UNMANUFACTURED	Produce of Canada Value	Reexports of Foreign Goods Value	Produce of Canada Value	Reexports of Foreign Goods Value
Crude rubber	.....	.....	$73	.....
Waste rubber	$43,905	.....	283,576	.....
MANUFACTURED				
Belting	$65,912	.....	$444,736	.....
Bathing caps	605	.....	3,638	.....
Canvas shoes with rubber soles.	37,511	.....	339,985	.....
Boots and shoes	261,576	.....	1,582,477	.....
Clothing, including waterproofed	38,141	.....	255,880	.....
Heels	3,267	.....	21,657	.....
Hose	72,697	.....	1,974,127	.....
Soles	6,093	.....	14,781	.....
Soling slabs	408	.....	9,049	.....
Tires, pneumatic	696,656	.....	4,655,265	.....
Not otherwise provided for.	26,873	.....	694,559	.....
Inner tubes	66,105	.....	476,458	.....
Other rubber manufactures..	109,501	.....	452,393	.....
Totals	$1,385,345	.....	$10,925,005	.....
Totals rubber exports...	$1,429,250	.....	$11,208,654	.....

Imports by Customs Districts

	September, 1941 *Crude Rubber		September, 1940 *Crude Rubber	
	Pounds	Value	Pounds	Value
Massachusetts	13,827,395	$2,622,021	16,918,163	$3,144,873
New York	109,664,403	20,971,721	122,842,085	21,327,842
Philadelphia	360,500	62,962	2,724,663	470,919
Maryland	7,096,788	1,295,571	13,894,149	2,344,017
Mobile	.....	.....	1,535,324	263,510
New Orleans	20,296,000	3,609,831	8,183,297	1,391,626
Galveston	.....	.....	67,244	10,302
El Paso	.....	.....	100,800	8,746
Los Angeles	23,672,321	4,363,195	9,586,868	1,556,783
San Francisco	9,825,705	1,706,542	1,045,424	186,274
Ohio	1,358,456	258,383	.....	.....
Colorado	156,800	29,468	.....	.....
Totals	186,258,368	$34,919,694	176,898,017	$30,704,872

* Crude rubber including latex dry rubber content.

WAX DRESSINGS FOR RUBBER GOODS

Dress up and protect your rubber products **with one of Johnson's water-repellent wax finishes! They give a *natural*, long lasting high lustre to rubber goods . . . protect them against deterioration at the same time.**

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Industrial Wax Division

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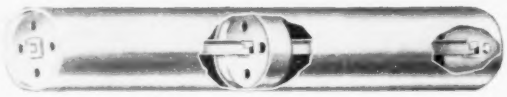

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Manufactured by
BROOKLYN COLOR WORKS, INC.
Morgan and Norman Avenues Brooklyn, N. Y.

United States Statistics

Imports for Consumption of Crude and Manufactured Rubber

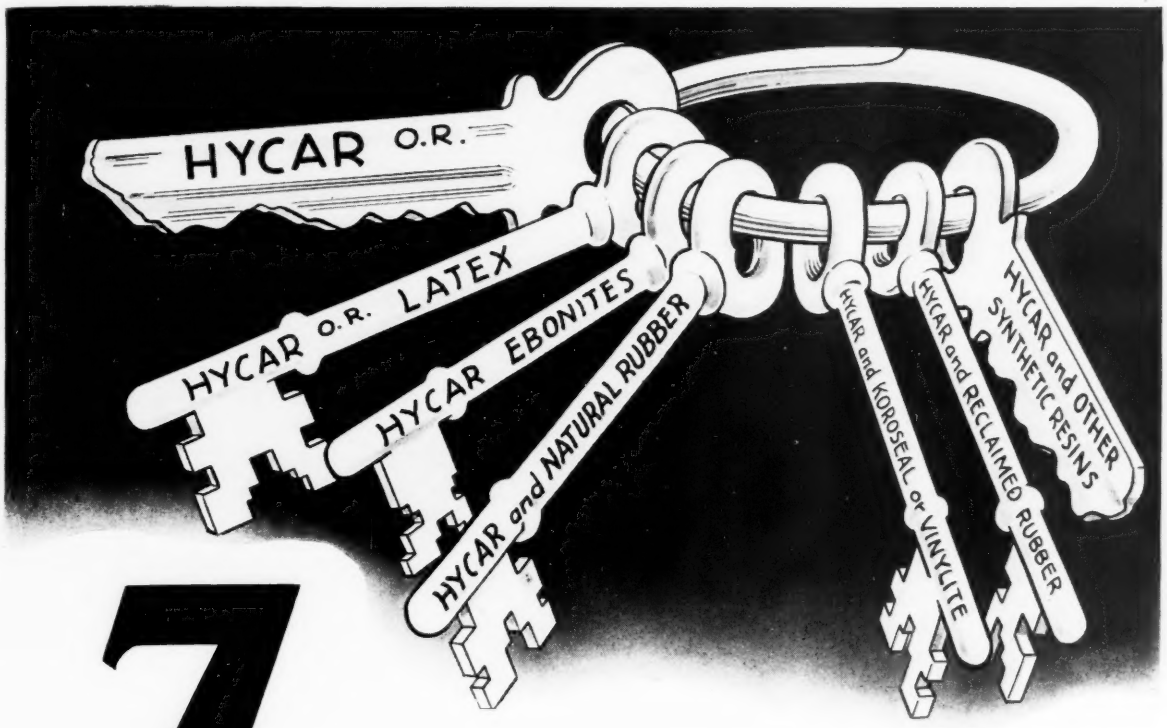
	August, 1941 Quantity	August, 1941 Value	Eight Months Ending August, 1941 Quantity	Eight Months Ending August, 1941 Value
UNMANUFACTURED—*Free*				
Liquid latex (solids)....*lb.*	4,443,527	$779,079	38,450,125	$7,485,206
Jelutong or pontianak....*lb.*	356,922	50,934	11,322,298	1,648,813
Balata ....*lb.*	92,225	19,344	1,043,591	218,694
Gutta percha ....*lb.*	259,024	31,844	2,318,145	366,552
Guayule ....*lb.*	1,118,030	111,502	7,179,830	733,912
Scrap and reclaimed ....*lb.*	1,739,535	38,326	11,955,465	280,675
Crepe soled rubber....*lb.*	37,800	8,925	291,591	65,616
Totals	8,047,063	$1,039,954	72,561,045	$10,799,470
Misc. rubber (above), 1,000 *lbs.*	8,047	$1,039,954	72,561	$10,799,470
Crude rubber ....1,000 *lbs.*	233,088	44,101,058	1,479,443	268,179,431
Totals ....1,000 *lbs.*	241,135	$45,141,012	1,552,004	$278,978,901
Chicle, crude ....*lb.*	33,814	$12,682	10,066,777	$3,715,701
MANUFACTURED—*Dutiable*				
Rubber tires ....*no.*	34	$488	3,989	$68,048
Rubber boots, shoes and overshoes ....*prs.*	1,020	178	19,454	7,221
Rubber soled footwear with fabric uppers ....*prs.*	8,425	1,328	595,200	117,547
Golf balls ....*no.*	47,616	5,450	346,272	38,670	
Lawn tennis balls....*no.*	.....	.....	225,336	30,914
Other rubber balls....*no.*	5,756	327	1,252,061	26,337
Other rubber toys....	.....	146	.....	7,203
Hard rubber combs....*no.*	.....	.....	.....	.....
Other manufactures of hard rubber	.....	.....	.....	184
Friction or insulating tape..*lb.*	528	681	23,909	16,049
Belts, hose, packing, and insulating material....	.....	10,176	.....	62,098
Druggists' sundries of soft rubber	.....	537	.....	3,983
Inflatable swimming belts, floats, etc. ....*no.*	.....	.....	235,846	21,889
Other rubber and gutta percha manufactures	.....	3,396	.....	89,952
Totals	.....	$22,727	.....	$490,095

Exports of Foreign Merchandise

RUBBER AND MANUFACTURES				
Crude rubber ....*lb.*	2,180,148	$448,299	7,668,736	$1,714,909
Balata ....*lb.*	10,026	2,732	183,568	72,334
Other rubber, rubber substitutes and scrap ....*lb.*	960	212	17,731	4,863
Rubber manufactures (including toys)	.....	6,808	.....	154,185
Totals	.....	$498,051	.....	$1,946,291

Exports of Domestic Merchandise

RUBBER AND MANUFACTURES				
Reclaimed ....*lb.*	2,670,652	$211,562	17,742,581	$1,015,504
Scrap ....*lb.*	2,761,488	26,197	36,611,071	536,710
Cements ....*gal.*	33,246	32,697	213,956	206,539
Rubberized auto cloth..*sq. yd.*	34,148	14,911	212,144	95,727
Other rubberized piece goods and hospital sheetings..*sq. yd.*	445,192	159,311	2,431,796	1,057,634
Boots ....*prs.*	4,865	12,164	59,477	140,725
Shoes ....*prs.*	9,461	11,688	135,070	99,236
Canvas shoes with rubber soles ....*prs.*	67,576	63,744	598,061	473,997
Soles ....*doz. prs.*	4,554	14,253	56,240	84,651
Heels ....*doz. prs.*	12,417	7,363	213,207	116,564
Soling and top lift sheets..*lb.*	51,057	16,131	293,515	77,123
Gloves and mittens..*doz. prs.*	7,790	17,864	78,446	158,190
Water bottles and fountain syringes ....*no.*	47,079	16,280	349,757	114,142
Other druggists' sundries....	.....	107,148	.....	714,751
Gum rubber clothing....*doz.*	19,405	65,051	124,876	327,032
Balloons ....*gross*	38,522	39,431	164,407	146,909
Toys and balls	.....	29,556	.....	105,399
Bathing caps ....*doz.*	5,388	9,058	31,605	56,563
Bands ....*lb.*	8,124	3,682	100,708	46,095
Erasers ....*lb.*	14,554	7,445	161,689	91,530
Hard rubber goods				
Electrical battery boxes..*no.*	14,745	11,996	204,858	154,842
Other electrical ....*lb.*	40,451	15,175	321,645	105,063
Combs, finished ....*doz.*	28,809	18,634	265,984	136,420
Other hard rubber goods....	.....	18,014	.....	149,445
Tires				
Truck and bus casings..*no.*	64,270	1,517,796	503,179	11,660,045
Other auto casings....*no.*	57,156	677,528	495,464	6,166,854
Tubes, auto ....*no.*	95,683	217,717	743,611	1,673,206
Other casings and tubes..*no.*	22,636	248,092	161,023	1,663,262
Solid tires for automobiles and motor trucks....*no.*	191	4,323	2,727	67,860
Other solid tires....*lb.*	47,354	6,130	546,804	87,439
Tire sundries and repair materials ....*lb.*	279,660	96,168	1,955,034	589,506
Rubber and friction tape..*lb.*	92,247	22,028	495,765	144,951
Fan belts for automobiles..*lb.*	57,045	27,471	333,841	162,936
Other rubber and balata belts ....*lb.*	140,964	97,137	2,304,662	1,224,918
Garden hose ....*lb.*	75,855	13,689	425,574	82,628
Other hose and tubing....*lb.*	434,082	269,968	4,860,362	2,186,861
Packing ....*lb.*	162,727	65,013	1,101,755	473,485
Mats, matting, flooring, and tiling ....*lb.*	118,631	17,246	967,581	137,513
Thread ....*lb.*	16,435	20,200	219,255	205,299
Gutta percha manufactures..*lb.*	1,514	1,167	361,573	122,360
Latex (d.r.c.) and rubber sheets processed for further manufacture ....*lb.*	207,891	47,668	1,429,894	293,996
Synthetic rubber (bulk)...*lb.*	72,579	37,265	693,820	355,878
Other rubber manufactures..	.....	169,516	.....	1,317,082
Totals	.....	$4,486,077	.....	$34,826,870



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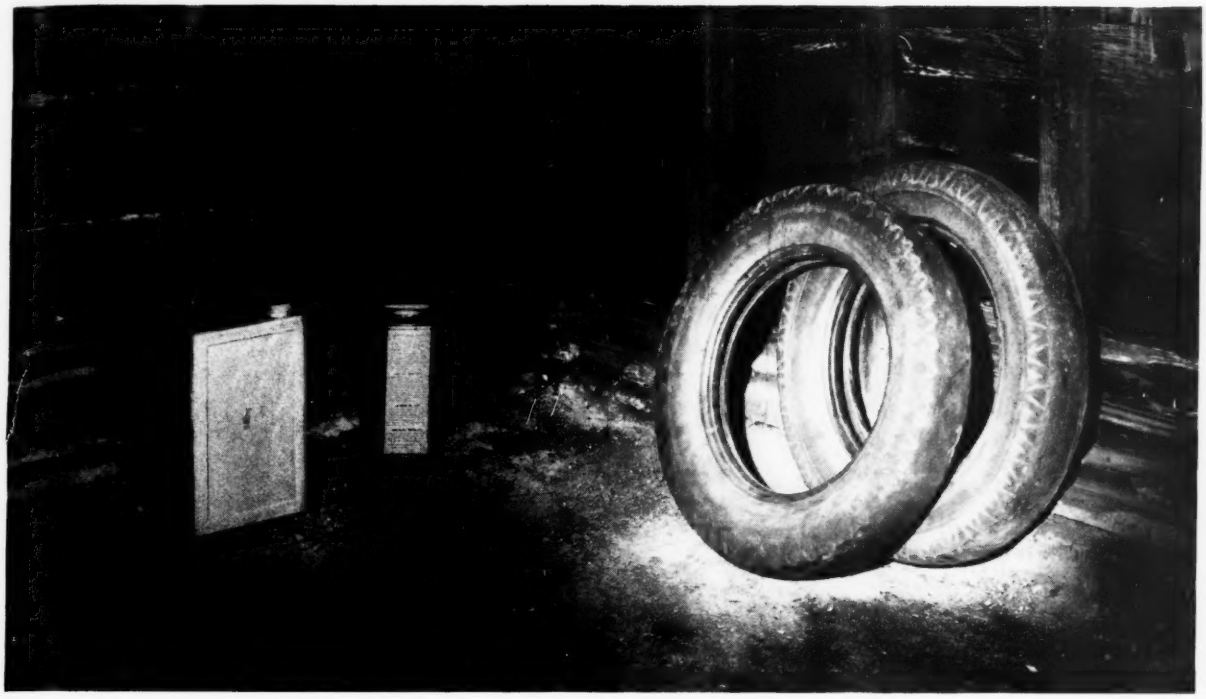

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